EDITORIAL

AN affirmative answer would be given by everyone to the question 'Do We Want Industrial Peace?' asked by Mr. George C. Mason in another column. Although Mr. Mason is a contractor, his reasoning is, in general, as applicable to the metal as it is to the building industries.

FOR the position of champion hard-luck victim we nominate the Modesto editor that scattered from an aeroplane leaflets extolling the virtues of a certain candidate, and who was arrested when he got back to earth under the city ordinance prohibiting the distribution of circulars on the street.

OUR attention has been called to a typographical error in our February number, near the bottom of the second column on page 70. The sentence reads, "In actual test, a 15-kw. machine heated 500 rivets, ½ in. diam. by ¼ in. long, etc.". As most readers of the article probably guessed, the length given should have been 1¼ inches.

STATISTICS compiled by the United States Bureau of Mines show that while the tonnage of coal mined in January was considerably greater than during last July, the number of men killed in mine accidents was actually smaller. The number killed per million tons of coal mined is decreasing steadily. Prohibition is a hell of a thing, isn't it?

A MUNICIPAL foundry has been proposed at Johannesburg, South Africa. Some of the officials are not satisfied with the price and quality of the work furnished by the local foundrymen, and they offer a municipally-owned plant as a solution of the problem. Apparently the proposed foundry is to confine itself to public work. Nothing is said about the attitude of the local foundrymen on the question but we strongly suspect that they are sitting tight and looking forward to the opportunity of purchasing some second-hand foundry equipment in a year or so.

STABILITY of the foundry industry is shown by statistics recently published showing output of iron in the United States for 1919 as compared with 1918. While the after-war 'slump' at the beginning and the steel strike at the end of the year combined to reduce the total production of pig-iron from 39,054,644 tons in 1918 to 31,015,364 in 1919, the production of foundry-iron and ferro-silicon, which was 5,145.260 tons in 1918, was nearly as great in 1919, being 4,916,758 tons. The production of malleable iron was 1,117,914 tons in 1918 and 1,009,049 tons in 1919, showing a greater proportionate decrease than that of foundry-iron but still considerably less than for all grades of pig-iron.

COKE for foundry and other metallurgical purposes on the Pacific Coast is so generally imported that Mr. Williams' article in this issue on the by-product ovens of the Granby Consolidated company will come as a surprise to many of our readers. Furthermore this coke is made from coal mined on the Coast, which opens the general question of the development of metallurgical coke in this region. A plant with a capacity equal to that of the Granby company's would go a long way toward supplying our industries.

KANSAS is a State that has, at different times in its history, tried a number of new schemes, some of which have worked well and some of which have worked badly. Just now they have established a so-called 'Industrial Court' with wider powers in strikes affecting food, fuel, clothing, and transportation than have before been granted in any commonwealth, far greater than those provided in the plan recommended in the report of the Industrial Conference. The plan adopted in Kansas appears to be working well, but whether it works or not, it is well worth watching. For this reason, particularly, we are glad to be able to publish extracts from an address by Governor Allen of Kansas, describing the plan.

THE California Manufacturers Association recently isued a questionnaire to its members in order to secure opinions regarding the value of the Federal Trade Commission. The replies received showed that relatively few manufacturers in this vicinity have had anything directly to do with the Commission. The opinions of those speaking from actual experience were unanimous to the effect that the expense and inconvenience of collecting information was out of proportion to the resulting benefits, and that the work of the Commission was superfluous and valueless. A summary of these replies has been forwarded to the committee of the United States Senate that is investigating the work of the Commission.

LIBERTY BONDS have reached new low figures during the past month, only one issue, the tax-exempt First 3½'s yielding less than 5% at the present prices. Based on the market on April 27, the yield for the various issues is as follows: First 3½'s, 3.90%; First 4's, 5%; First 4¼'s, 5.20%; Second 4's, 5.22%; Second 4¼'s, 5.50%; Third 4¼'s, 5.70%; Fourth 4¼'s, 5.55%; and Fifth 4¾'s, 6.13%. The difference in the quotations is mainly caused by the difference in dates of maturity, the Fifth Loan bonds, in particular, being a short-term security. When it is considered that the Civil War was financed mainly by securities bearing 7.3% interest, and these bonds were below par for a long time, the present rates of return do not seem remarkable.

Generated on 2024-09-30 02:14 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Commissioner's Powers Limited

The Federal Trade Commission is composed of men having the best of intentions, but who seem to lack discretion in certain matters and to be over-inquisitive. Recently, the Commission addressed a questionnaire to various business firms, which included questions relating to many matters of a private nature, such as production, costs, shipments, sales and contracts prices, amount of business under contract, and financial position. One of the firms addressed, the Maynard Coal Co., brought suit to test the Commission's powers, and the Supreme Court of the District of Columbia has decided against the Commission. Firms that have felt that the Commission was showing a tendency to go beyond its proper field will be interested in this decision.

Progress in Deisel Engines

At this writing the first Werkspoor Diesel engine to be built in the United States has completed two-thirds of its thirty-day non-stop test-run. The construction of this engine by the Skandia Pacific Oil Engine Company marks a considerable advance in engine-building practice on the Pacific Coast. The manufacturers of these engines are using greater refinements in the methods of manufacture and are working to closer limits than is customary in this country. This engine is of the true marine type, narrow, high, and light, and is conservatively rated by the manufacturers. The mean effective pressure at normal rating is 85 pounds, compared with 120 pounds for the average American high-speed Diesel engine. The guaranteed rating of this engine is 825 brake horse-power, but the 30-day test is being made at 912 brake horse-power. Prior to this test the engine was run for 24 hours at 1100 brake horse-power, equivalent to 1460 indicated horse-power. All the work on the engine has been done to close limits, based on Johansson master-gauges. The materials used have been subjected to laboratory tests. Quality has not been sacrificed to economy in either material or workmanship.

Steel Prices

An interesting commentary on the popular belief that large corporations are composed mainly of bold bad men engaged in the twin pursuits of holding up prices and holding up the public, is found in the address of Elbert H. Gary at the annual meeting of the stockholders of the United States Steel Corporation. He stated that the directors have refused to increase prices over those fixed on March 21 of last year by the ill-fated price-fixing board because in their judgment every effort should be made to prevent further increases in the cost of living. It is true that in the runaway market of the past few months, the independent mills have increased prices repeatedly, and it is also true that the prices the consumer must pay for prompt delivery are, for most products, far in excess of the Steel Corporation's quotations. This policy of the 'independents' may have been, and very likely was, entirely justified. But from the tangle of the past few months, two facts stand out clear: First, that the United States Steel Corporation is not able to control prices. Second, that whatever influence the Corporation has, was exerted to prevent an increase in prices, and, consequently, for the time at least, to prevent an increase in its own profits.

Hoover

Five weeks from now the Republican National Convention will be meeting in Chicago. It would require a bold man to predict what will happen there. A few things, however, seem certain. No choice will be made on the first ballot, probably none on the first three or four. The delegates will then be faced with the problem of finding a man who will be fairly acceptable to the following of at least several of the other candidates in the convention, and more important yet, a man that can get votes on Election Day. We believe that both these circumstances will be favorable to the nomination of Mr. Hoover. In no State have his supporters carried on a mud-slinging campaign against any of the other candidates. Furthermore, without considering his popularity in his own party, hundreds of thousands of Democrats would vote for him that would not vote for any other Republican nominee. And votes are votes, even in this so-called Republican year. It may easily happen that the Convention, weary of balloting, will turn to Mr. Hoover just as the whole United States as well as other countries have turned to him in other times of stress, serene in the knowledge that he will make good. We hope so.

Another Fool Strike

For the past year it has seemed that every time we got the industrial machinery of the country properly repaired and oiled and ready to work efficiently and reduce the cost of living, somebody would throw a monkey-wrench into the gears by calling a strike. First it was the steel strike. The steel industry was beginning to recover, and the rest of the country to hope for normal deliveries when along came the coal strike and mussed things up worse than ever. The direct effects of both the steel and the coal strike have nearly disappeared, but we have a railroad strike on our hands. While the number of men directly involved has been smaller than for either of the other two strikes, the indirect effect upon industry in general has been nearly if not quite as great. It is probable that, although most railroad employees have received increases in pay measurably comparable to the increased cost of living, many of the strikers have just cause for complaint. The pity of it is that they can see no other way to obtain redress of grievances than by striking, thus

Generated on 2024-09-30 02:13 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

increasing the cost of living for everyone, themselves included. An encouraging feature of the present strike is the lack of support or even sympathy from organized labor in general. The officials of the brotherhoods, recognizing that a strike in violation alike of agreements and of union rules is directly subversive of their own organization, have joined with company officials in efforts to keep traffic moving, and at this writing an early return to normal conditions seems probable.

Shop Committees

The address recently delivered at the annual meeting of the stockholders of the United States Steel Corporation by Elbert H. Gary, chairman of the Board, gives evidence of the speaker's, and with him the Corporation's, desire to do the right thing in dealing both with employees and with the public. Thoughtful students of labor problems will, however, regret that he voiced his disapproval of shop committees, and his preference for the Steel Corporation plan which he describes as follows: "Any employee or any self-appointed group of employees * * * is at liberty at all times to present to the respective foremen, and, if desired, to the higher appointees or the officials, all questions involving the interests and welfare of both employer and employee * * *." In other words, the Steel Corporation's plan is the old 'family' system, admirable in the small plant, possible under favorable conditions in one employing as many as several hundred men, but a system which can hardly work with 100% efficiency in an organization as large as the Steel Corporation. We do not doubt that the Corporation's general labor policy is just and humane, nor that Judge Gary and his fellow-directors desire that every reasonable complaint shall be given a respectful hearing, but it is hard to believe that this end can be obtained by this method as well as with a regularly constituted shop committee. Probably even the best shop-committee system could not have prevented the strike of last September, but had such a method of presenting grievances existed, Judge Gary would have had much stronger grounds, in the eyes of both his employees and of the public, for his refusal to meet W. Z. Foster and his associates.

Liberty Bonds

As an aftermath of the recent break in the price of securities of all kinds which carried down Government bonds along with everything else, has come much complaint to the effect that 'the Government ought to do something' to bring the price up to par. Just what should be done or what public good could be accomplished by doing it is not explained. During the War, people, sometimes because of patriotic motives and sometimes because of reluctance to say 'No' to insistent urging, bought Liberty bonds at par; although they knew the market price would immediately be lower. If the Government was remiss at any time, it was then, in failing to offer a higher rate of interest. Now the War is over, except in the minds of the Senate and the President, and Government bonds must compete in the investment market with tax-exempt State and municipal bonds for men with large incomes, and with ordinary high-grade securities paying 6 and 7% for men with incomes small enough to be little or not at all affected by the surtax. A further complication is presented by the fact that, in spite of much selling, since the Armistice, a considerable part of the Liberty issues is still in what the financier calls 'weak hands'. Some of these 'hands' are actually weak, but more often the apparent weakness is merely an indication that the desire for some luxury is stronger than the desire to retain savings. Since the latter happens so often it is fortunate that the price of the bonds is as low as it is, otherwise there would be more trading in them, with consequent continued inflation of prices. Hold on to your bonds if you can. They will go back to par eventually. But, if you can't afford to keep them, remember that your loss in selling does not hold a candle to what you would have had to pay if the Kaiser had won the War.

The Bay District Strike

But little change is to be observed in the strike situation in the shipyards and shops of the San Francisco Bay district. Efforts made by various national and international union officials, who were in San Francisco last month, to effect a settlement of the strike ended in complete failure, the California Metal Trades Association refusing to confer with them. The shipyards are all running 'open', and are delivering vessels. Sufficient authoritative data regarding present efficiencies are not available, but it might be pointed out that even an absolutely 'green' man that entered the yards when they opened last November has by now had more experience in shipyard work than the average union man in the yards had had at the time of the signing of the Armistice, and that furthermore, with the demand for output at all costs characteristic of war times removed, more time is available for training inexperienced workers. It is therefore reasonable to take the claims of inefficiency made by union officials with several grains of salt. The 'outside shops' may be divided into three general classes; the majority that are both nominally and actually open; those that are nominally open, but which are employing union men only; and those that are working practically under the old union conditions. In recognition of the fact that their work in general requires a higher degree of skill than the work in the shipyards, the shops in the Association, while they are continuing to pay the Macy scale of $6.40 per day for mechanics at the time of hiring, are raising their really skilled men to $7.20 after a month's probationary period. This rate is sixteen cents higher than that demanded by the unions last summer, but it has long been recognized that the main point at

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

issue was not wages but low efficiency and union interference. This higher rate has proved attractive to the former employees and many of them are returning to work. In general, it might be said that yards and shops are experiencing the same labor shortage that is troubling all employers, but very little more. Men in the union foundries continue to refuse to work on so-called 'unfair' jobs, and large quantities of castings for Bay District shops are being made in outside foundries, some work going even as far as Los Angeles.

Foremen's Training Classes

Kipling has called attention to the fact that "The backbone of the army is the non-commissioned man." For similar reasons, we might say that the backbone of industry is the foreman, although if the matter was left to a vote of the foremen themselves, the word 'goat' would probably be substituted for 'backbone'. In the development of industry from the small shop run by the owner to the factory employing thousands, a large and varied assortment of duties was piled upon the foreman. To mention only a few of the more important of these, he usually has to oversee production, hire and fire workers, train those he does not fire, maintain a supply of stock for the machines, adjust minor, and frequently major, differences and grievances, and, in general, represent the management to the workers. Scientific management has handed a number of these responsibilities to other officials, usually without asking the foreman whether he liked it or not, but the foreman will always have plenty to do, nevertheless. In view of these facts, it is strange that until recently, no training for the foreman has been provided, other than the training received as he has worked his way up from the position of ordinary employee. The provision of training for foremen has, in fact, lagged far behind the provision of technical training for executives and staff employees, or even the provision of training for ordinary workers. This is partly because of certain difficulties in the way of training foremen that do not apply, or apply in a lesser degree at least, to the other two classes of training. Technical training for the higher positions usually presupposes that the man's entire time is to be devoted during the period of training. This is something that the foreman, present or prospective, can seldom afford to do. On the other hand, most companies maintaining, or co-operating in, training for workers have found that classes conducted after the completion of a full day's work do not produce the best results, and that there is actual economy in conducting classes on 'company time'. It is comparatively easy to arrange this for the ordinary worker without interfering with the output of other employees, but if the foreman is not on the job all the time, production is sure to suffer. Nevertheless, many concerns are finding the establishment of foremen's training classes to be of advantage, and we may expect that the number of these will increase in the near future.

Overalls and the H. C. L.

Many of our readers are fortunate enough to be engaged in work in which the wearing of overalls has long been customary. Many others, who are not so happily situated, are considering following the example of various notables who have taken up the 'overall craze'. Perhaps even now some subscriber is seated at his desk, encased in a brand-new specimen of the tailoring of Levi Strauss & Company, and he as well as others may be wondering whether the movement will have any great effect on the general cost of living. We do not believe that it will. A number of men, who have been wearing ordinary business clothes, will buy a new pair of overalls. This will increase the demand for, and probably the price of, overalls. On the other hand, relatively few of these men were intending to buy a new suit in the immediate future, because the number of men rich enough to afford to buy new clothes except at long intervals is relatively small. Perhaps the manufacturers and dealers in clothing will be worried sufficiently to make some reduction in their prices, but that is by no means certain; nor is it certain that the net saving to consumers of ordinary business clothing will offset the higher prices that will be paid by other consumers for overalls.

The principal effect of such sentimental movements away from the consumption of one commodity and in favor of the consumption of another must, however, be further to unsettle existing business conditions, and that is no way to make any permanent reduction in the cost of living. The only ways to do that are to reduce consumption or to increase production. So far, we have done little or nothing toward bringing either back to pre-war standards. The reports of several steel companies show that in spite of greatly increased wages, the output per man has decreased about 25% during the past few years. Other industries may not be as badly situated, but there are few, if any, where output per man has not been reduced. Probably many people used to work too hard in the old days. It may even be true that most of us did so, and that we would be better off if we slackened our pursuit of the Almighty Dollar and accepted the inevitable result, a simpler life and a lowered standard of living, which mean the same thing. There are certain features of the plan that are attractive, particularly in these mild spring days. Let's go fishing beside some clear mountain stream. Poets and others have been advising us for some time to take this attitude toward life. Maybe they are right.

The trouble is, however, that the people that want to go fishing nowadays want to go in a $5000 car with a $25 rod, and a $300 camping outfit. They are quite willing to reduce production but they want to keep on consuming as much or more than they ever did. It can't be done. Pretty soon, if a good many people do that, there isn't enough gasoline, there isn't enough cotton and rubber for tires, there isn't enough bamboo for fishing-rods, there isn't enough anything. And that is what is the matter with us right now.

Generated on 2024-09-30 02:12 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

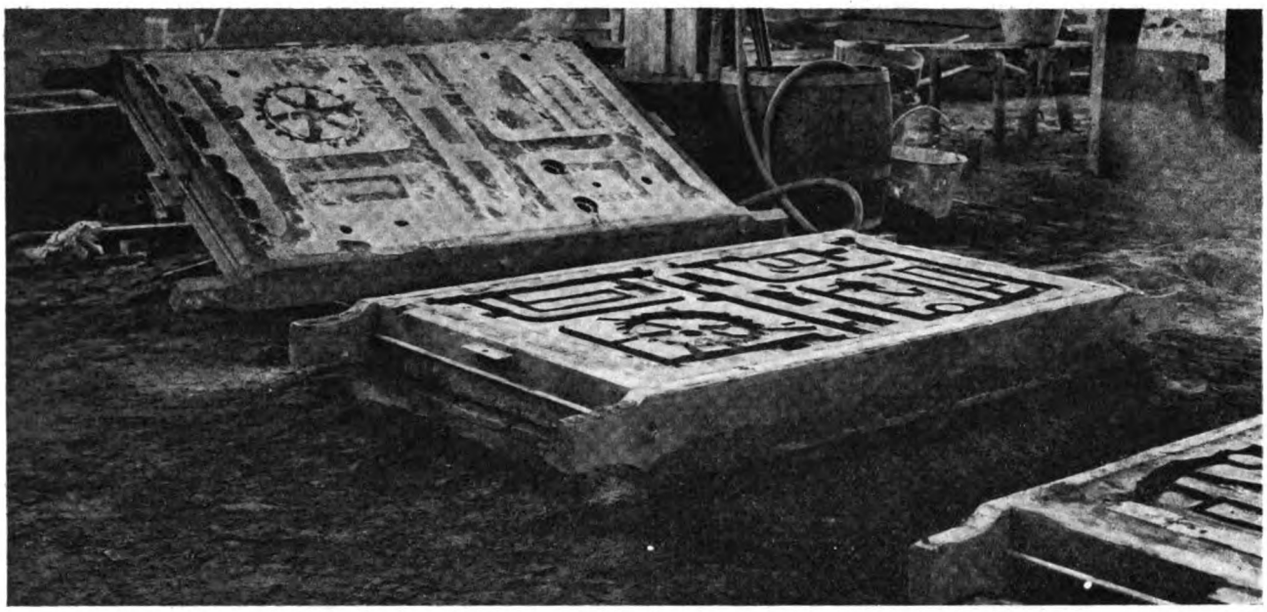


FIG. 17. MOLD TO CONTAIN 14 DIFFERENT CASTINGS READY TO CLOSE

Increasing Foundry Production by Improved Pattern Equipment

The Anderson-Barngrover Manufacturing Co., of San Jose, has been manufacturing canning, packing, and drying machinery for a number of years. The company's product is varied, its standard line alone comprising about sixty machines, besides which much of the work is on special order. Consequently, until recently, the number of pieces from any one pattern has not been enough to warrant preparing any of the patterns for quantity production. The demand for the company's machines, particularly for the continuous cooker and for the disk exhaust-box, has, however, increased materially, and, during the past year or so, extensive improvements have been made in the pattern equipment for those castings for which there is the greatest demand. Loose wooden patterns have been replaced by match-boards, and in many cases aluminum has been substituted for wood. Cores

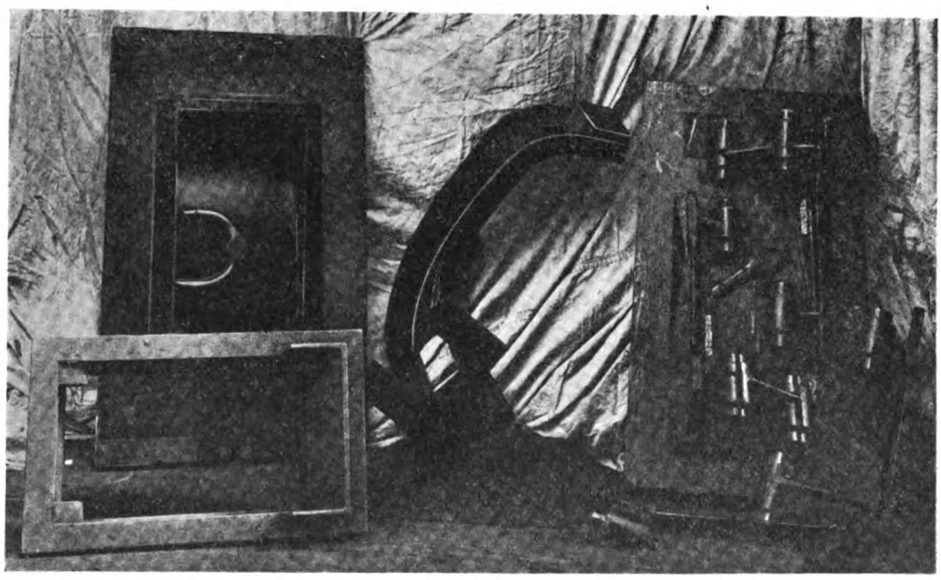


FIG. 10, 11, AND 12. COOKER-DOOR CASTING AND PATTERN, FEED-CHUTE PATTERN, AND PATTERN FOR INTERNAL-GEAR BEARING

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

have been eliminated in some instances, while in others cored holes have replaced drilled ones. All of this has been, and is being done in close co-operation with the foundry, and no innovation is considered settled until it has been definitely shown to give better results in the foundry or the machine-shop or both.

Fig. 1 shows a wooden match-board pattern used in the manufacture of a small bracket for the disk-exhaust box. Several thousand of these brackets are made every season. Fig. 2 shows an aluminum match-board pattern for an offset-bracket for a disk-shaft. The core-box used is shown in front of the pattern. Fig. 3 shows an aluminum match-board pattern for a canning-table seat, also the aluminum pattern for the nut used with it.

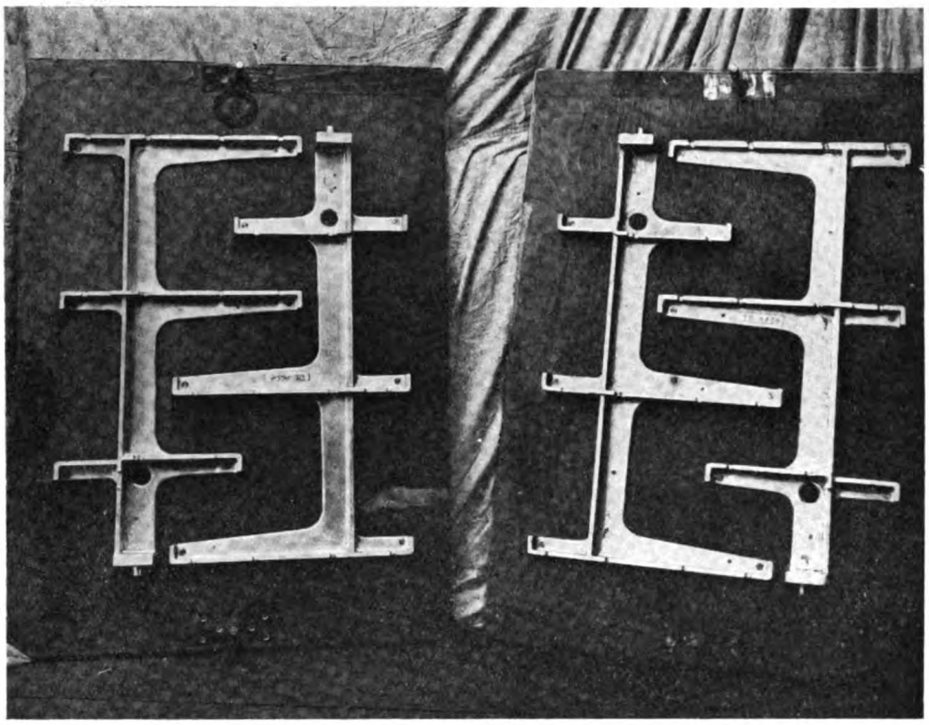


FIG. 7. PATTERN FOR CANNING-TABLE BRACKET

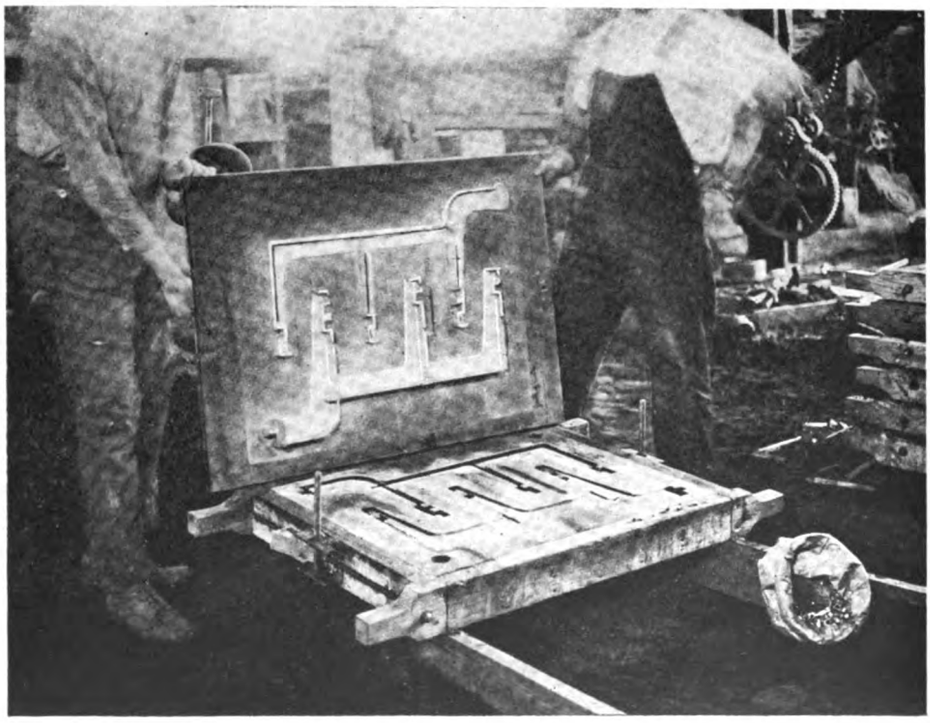


FIG. 8. FLASK AND PATTERN FOR CANNING-TABLE BRACKET JUST AFTER DRAWING PATTERN

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from
UNIVERSITY OF ILLINOIS AT
URBANA-CHAMPAIGN

No cores are used, and both nut and seat are cast with sufficient accuracy that no machine work is required on the castings.

Fig. 4 shows a wooden match-board pattern for a 12-in. gear used in the disk-exhaust box, also the stripping-plate made from a copper sheet, used with it. The small loose piece fits into the recess in the centre of the gear. An aluminum pattern for a double gear also used in the

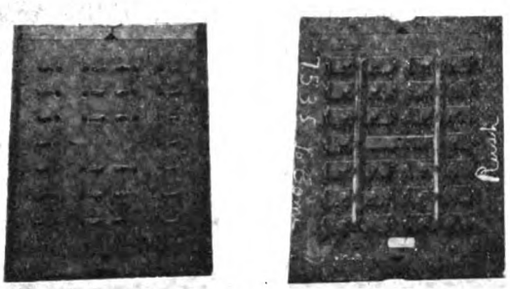


FIG. 1

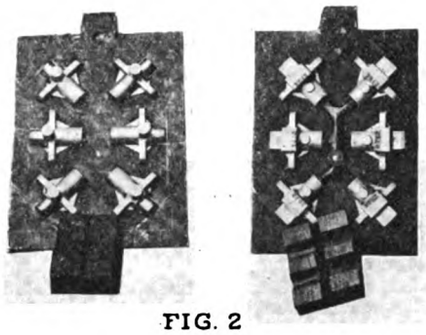
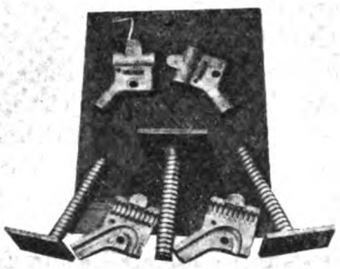


FIG. 2

FIG. 3



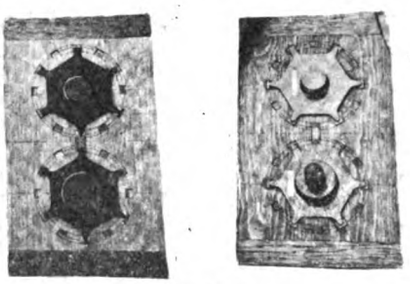


FIG. 6

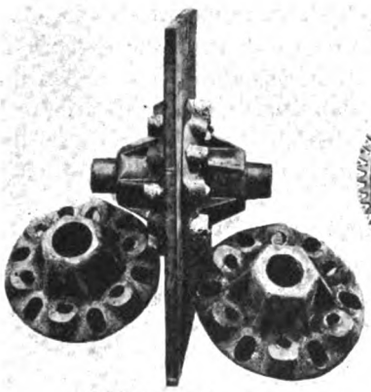


FIG. 14

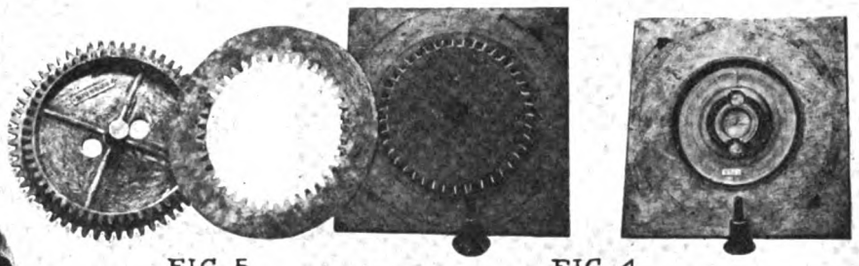


FIG. 5 FIG. 4

FIG. 13

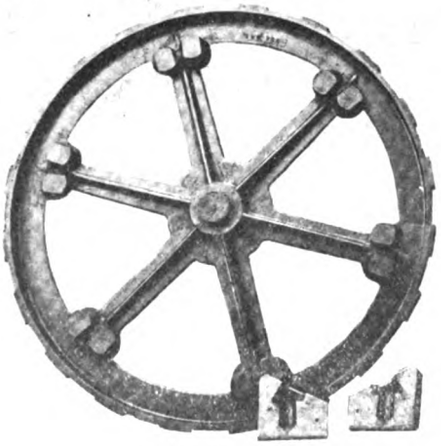


FIG. 15

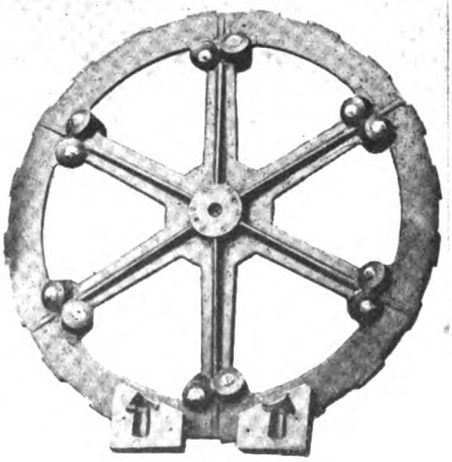


FIG. 16

VARIOUS PATTERNS USED BY THE ANDERSON-BARNGROVER COMPANY. FOR DESCRIPTION SEE TEXT.

Generated on 2024-09-30 02:07 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

exhaust-box is shown in Fig. 5. The pattern for the smaller gear is made separate from the main pattern and fits on it with four pin-projections and recesses. The other side, which is plain except for the spindle, is not shown. A wooden match-board for two types of elevator-drive sprocket for the continuous cooker is shown in Fig. 6.

Fig. 7 shows the duplicate aluminum patterns for the canning-table brackets or supports. Two men work together on these castings in the foundry, one man making

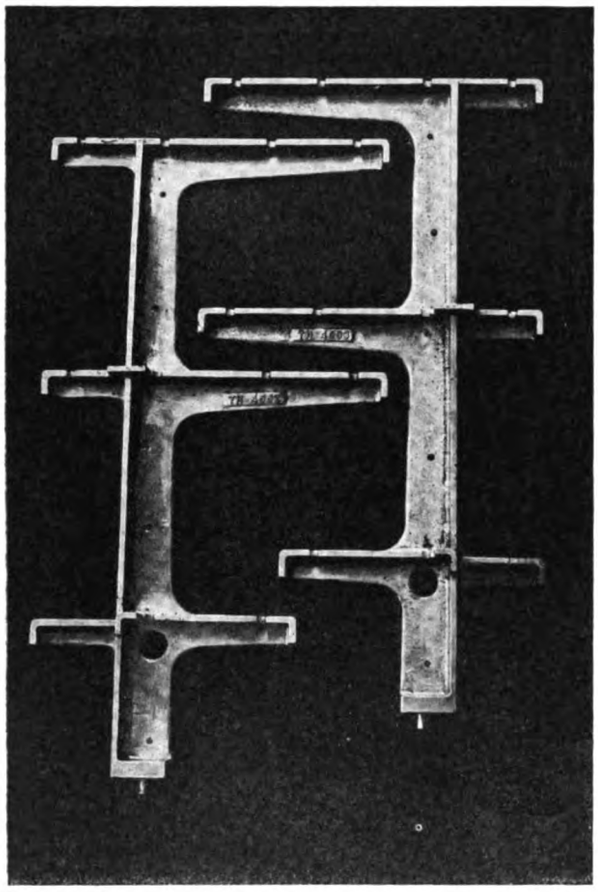


FIG. 9. PATTERN FOR CANNING-TABLE BRACKETS

the cope and the other the drag, and they work together to draw the pattern and to close the mold. The pins in the board make an accurate fit certain. Fig. 8 shows one-half of the mold complete with the pattern just drawn behind it. In the old days when this casting was made from loose wooden patterns a great deal of trouble was experienced because of patterns getting out of shape, poor draws, etc. The completed casting has 11 bolt-holes, $\frac{5}{16}$ in. and under, which come at the points where small recesses in the pattern are seen. Small 'stove-cores' shown just in front of the flask are fitted into each recess, and this method has been found to be much superior to drilling the holes afterward. Fig. 9 shows a similar 'right-and-left' pattern for the brackets at each end of the table.

Fig. 10 shows the wooden patterns for the internal-gear bearing for the continuous cooker. As will be seen, two are cast in each flask, the lower half of the patterns being bedded with the aid of the follower-board. The follower-board is then removed and the upper half of the patterns placed. Fig. 11 shows the casting for the frame for the doors in the side of the continuous cooker, through which the cans of fruit may be removed, and behind it is the wooden match-board pattern used. Another complicated pattern, that for the feed-chute for the cooker is shown in Fig. 12.

Fig. 13 to 16 illustrate particularly the use of cored holes in places where drilled holes were formerly required, and also the use of tapered cores. Fig. 13 shows the casting which is placed at various points along the continuous cooker to hold the bracing-rods in place. Behind it is the wooden match-board pattern, also the core-box and the stock-cores used. Fig. 14 shows a side-view of the pattern. Fig. 15 and 16 show the pattern for the reel-head used in the cooker, together with the core-box.

It will be noted that this core also is tapered. Some of these reel-heads are made of steel and some of cast-iron. Formerly the 12 holes in both the brace-holder and the reel-head were drilled on a radial drill, and furthermore, each one had to be drilled at an angle. With the present method, reaming even is not necessary, the brace-holder requiring only reaming the hub and the reel-head reaming the hub and facing the rim. The tapered cores ensure that there will be a clean hole with no fins at the end of it.

Although orders for large numbers off the same pattern have become the rule rather than the exception in the foundry, there is still a considerable variety in the work, requiring careful planning to get the maximum service each time a flask is used. Fig. 17 shows a 36 by 72 in. flask ready for closing that accommodated 14 patterns all slightly different.

Acknowledgment is due to the staff of the Anderson-Barngrover company, particularly George Fowle, foreman of the pattern-making department for hearty co-operation in preparing this article.

Drop-Forgings v. Bar-Stock for Milling Cutters

In an article appearing recently in the 'Journal' of the American Steel Treaters' Society, A. F. MacFarland gives a report on comparative tests made on milling cutters made respectively from bar-stock and from drop-forgings. The tests were made during regular production in a large automobile factory. The work was cutting a ring-gear. In all the tests, the same milling machine was used, with three cutters on the arbor. The cutters made from bar-stock produced an average of 73 gears per grinding, and a total of 672 gears. The drop-forged cutters made 95 gears per grinding and a total of 1335 gears. The steel used had the same composition and was hardened in the same way.

Generated on 2024-09-30 02:10 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Some Modern Methods of Heat-Treatment*

By JOHN E. HALBING and FRANK SHEPHERD†

The selection of a material for a machine-part should be governed by the size and shape of the piece, the requirements to be met in service, whether the heat treatment necessary to produce the physical properties in the ultimate part with the steel selected can be practically applied on account of the shape and size of the part, and whether the ultimate cost of the part would be prohibitive. For certain parts there may be several different kinds of steel that would serve equally as well if given a suitable heat treatment. For instance, a part fairly uniform and generous of cross-section, which must have a hard wearing-surface, and which would meet with only slight stresses in service, could be made from a tool-steel or any straight carbon or alloy casehardening steel and the cost of the steel and the heat treatment could decide the selection. There are other parts, however, that must resist severe shocks or strains in service and at times possess great resistance to abrasion for which, possibly, only one grade and analysis of steel will satisfactorily meet the requirements.

Once the steel has been selected from which certain machine-parts are to be made it is then up to the manufacturing department to produce those parts on a commercial basis. Often, particularly in broaching and threading operations, the steel will tear and 'mush up', because of being too soft, leaving a rough surface and in some cases breaking expensive broaches. By proper heat treatment such parts can be rendered suitable for those operations.

A 0.10 to 0.20% carbon-steel quenched in fresh water from 1625°F., or a 0.12 to 0.22% carbon chrome-vanadium steel quenched in oil from the same temperature, possess the requisite threading and broaching properties. Through such heat treatment the Brinell hardness on 0.10 to 0.20% carbon is raised from 145 to 200 and on the low-carbon chrome-vanadium from 185 to 205. A 1.0% carbon steel, which tore badly in broaching and that showed a Brinell hardness of 165, when heated to 1420°F. and cooled in the atmosphere of the shop tested 200 and broached perfectly.

Some heat treatment should be applied to all forgings, whether they are machined or not.

Some heat treatment should be applied to all forgings, whether they are machined or not, such as an annealing above the critical or a quench from above the critical (the exact method of heating and cooling, of course, would depend upon the grade of steel). For a forging that needs no hardening treatment after machining, a treatment necessary to bring out the requisite physical properties could be applied to the rough forging unless it were of considerable size, when it has been found good practice to anneal thoroughly in the rough and apply the finish for 'full' heat treatment after the excess material has been removed by machining. For those forgings that require hardening after machining, heat treating refines them (or normalizes them, as some like to call it) to the extent that the machining operations can be speeded and the parts when they are hardened are less susceptible to distortion.

The distortion in hardening of parts machined from bar-stock can be considerably lessened by heat treatment after they have been partly machined.

The efficiency of the open-fired or the semi-muffle furnace depends entirely upon the operator.

With the use of the open-fired or semi-muffle furnace the work is at the mercy of the 'man on the job', from the time it is placed until it is taken out, even though the most accurate temperature indicating devices are employed. We will suppose that the time-temperature curve as shown on a recorder connected to an open-fired furnace during a heat was perfect. The operator could at any time during the heat use more air-blast than was necessary for perfect combustion, producing an oxidizing atmosphere in the furnace and oxidize the surface of the work being heated so that the pieces would be practically worthless when taken from the quench.

On the other hand, taking an extreme case, more oil than is necessary to perfect combustion could be used, producing a reducing atmosphere so that carbon would be deposited in spots upon the surface of work, rendering those spots hard and brittle when quenched, and if the work were of a character having sharp teeth, corners, or projections it could lead to the breaking or flaking of those sections when quenched. This condition, however, is not as frequently met as the former, for when the atmosphere is reducing, a black smoke is seen and it usually would be corrected by the operator, if he were at all on the job.

Looking at it from another angle, it is, or should be, entirely up to the man that observes each individual heat to determine the speed with which the work should be heated to the quenching temperature, as he only is in a position to determine whether the work is lagging too far behind the furnace. If the furnace is driven too fast, uneven heating is the result with the tendency to buckle long pieces even though the pieces are turned frequently. Unless governed by thermo-static control (and this is not practical as yet with oil-fired furnaces) it is practically impossible for the heat treater to operate his furnace so as to produce the same heating-curve on every heat.

*Abstract from 'Journal' of American Steel Treaters' Society.

†Heat-treating department, Ingersoll-Rand Co., Phillipsburg, New Jersey.

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Then, too, there are other factors over which the operator has no control such as burner trouble, motor breakdowns, pump trouble, or the quality of fuel-oil used, all of which cause trouble on open-furnace work. For instance: If a heat had been brought up to the required temperature or very near it and to all appearances was perfect in every respect, and the oil became sluggish or a piece of dirt clogged the burner or the fan or possibly the pump stopped, the heat would immediately drop. The tendency, after the trouble was adjusted, would be to bring the heat back in the shortest possible time to the temperature attained before the trouble arose and would invariably oxidize or distort the work beyond hope of restoration.

These factors have no effect upon the work heated in a good lead or molten solution, as the products of combustion do not come in contact with the work, changes in temperature of work are effected slowly through the pot and bath, and unless too many pieces are placed in the bath at one time there is little chance for non-uniform results arising from the heating operation.

Care should be taken, however, to prevent baths from oxidizing the work. For cyanide solution, enough pure sodium cyanide should be added from time to time to keep the properties of the bath up to slightly casehardening, and for a lead bath either a coating of wood charcoal or about ½ in. of cyanide solution or potassium chloride and sodium chloride should be kept on the surface to prevent oxidation of the lead which would in turn oxidize the work being heated. A coating of cyanide or potassium-chloride and sodium-chloride solution over the surface of the lead bath renders the work clean when quenched in water or brine. When quenching in oil it has been found best to use a coating of charcoal.

In the hardening of tools such as drills, taps, reamers, broaches, and threading-dies, from a lead or solution bath or a muffle-furnace it is good practice to obtain a small disk from the bar from which the tools were made, and before proceeding with the hardening of the finished tools, harden the disk in the same manner in which it has been decided to harden the tool. By examining the fracture of the disk a good idea can be obtained as to what the hardening temperatures for the tools should be.

On production work when the machine-parts are treated in quantity it is advisable first to harden and break one part and by its appearance regulate the hardening of the remainder.

Good results have been obtained with taps and reamers made from a 1.0% straight carbon steel when heat treated as follows:

Operation No. 1. Rough-machine from bar-stock.

Operation No. 2. Heat thoroughly, preferably in a semi-muffle furnace to 1425°F. and leave to cool in furnace.

Operation No. 3. Finish-machine.

Operation No. 4. Pre-heat in a lead bath to 1150 to 1250°F.

Operation No. 5. Transfer to another lead bath heated to 1400 to 1420°F. and heat thoroughly to 1400 to 1420°F. then quench vertically, tang downward, partly in salt brine at about 70°F., finishing the cooling in oil.

Operation No. 6. Temper in oil to 425°F.

The second operation, namely, the annealing after rough machining, has been found of great benefit in lessening the distortion in hardening. For many tools this way of annealing has proved, in our experience, to be superior to pack-annealing. Operation No. 4 could be performed in a semi-muffle furnace if care is taken to see that the furnace has been heated thoroughly to the specified temperature before the tools are placed for pre-heating and that the tools are not laid too near the edge of the tile or over a joint or crack in the furnace where parts of the tools might be subjected to a flame of intense heat. The latter precaution cannot be over-emphasized, for a large proportion of the 'running off' of the corners of tools in hardening is the result of 'fire cracks'.

Good results have been obtained with broaches up to 48 in. long by first machining them from bar-stock and hardening as follows:

Pre-heat in a semi-muffle furnace at 1200°F., turning the broaches in the furnace frequently to ensure uniform heating. When thoroughly heated transfer to a lead bath covered with cyanide solution and heat to 1400 to 1420°F. and quench, vertically, almost entirely in brine, finishing the cooling in oil. These are not tempered. By wrapping the undercut sections between the teeth of the broaches with asbestos cord the effect of quenching is retarded so that they are left somewhat soft in those sections, thereby facilitating straightening without much fear of breaking in the event of their distorting in the hardening operation.

Gauges made from tool-steel are hardened by several methods. Those with plain surfaces, which can be ground after hardening, are usually finish-machined, less grinding, from the bar, then hardening by heating slowly to 1400 to 1440°F. (the temperature depending upon the size of gauge), quenching entirely in salt brine and drawing in oil to 400°F. The hardening of thread-gauges is a somewhat different problem. Because of the inability to grind them they are finished to sizes before hardening and must be held to shape in hardening. Many of these gauges are finished to as close as 0.00025 in. and must hold those sizes through the hardening. If they shrink in hardening they are doomed to the scrap-pile. If they expand there is a chance of using them by lapping; but as lapping, at best, is a long-drawn-out, tiresome, and expensive operation, the hardener is given no room for excuses.

A practice followed for a long time with good results consists in:

1. Rough-machining from bar-stock.
2. Heating thoroughly in a semi-muffle furnace to 1425°F., leaving to cool in furnace.
3. Finish-machining.
4. Packing in carburizing compound and heating at 1425°F. for three to four hours after it is heated through, leaving to cool in the pot.
5. Unpacking, then re-packing (with the gauge in position opposite to the position for the previous operation),

Generated on 2024-09-30 02:09 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

heating at 1425°F. for three to four hours after it is heated through, and cooling directly from the pot in a good mineral-oil.

There are three distinct methods of carburizing, namely, the 'dry' or 'pack-carburizing', 'gas-carburizing', and the 'liquid-bath' methods, each of which has its own particular advantages.

The 'dry' or 'pack-carburizing' method consists of packing the articles to be carburized in pots or boxes with a solid carbonaceous compound and heating to a temperature above the critical long enough to obtain the depth of case desired, after which the articles are either left to cool in the boxes or quenched directly from the boxes in oil or water. The carburizer, the pots or boxes, and the furnaces used in the application of this method are of equal importance.

The best materials for packing-boxes for carburizing are, in order of their superiority, ordinary gray cast-iron, white cast-iron, cast-steel, and the alloy of nickel and chromium called nichrome. For nearly all purposes gray cast-iron is the least satisfactory and in the long run it is the most expensive. The special mixtures in white cast-iron and cast-steel are much superior to gray cast-iron and are on about a par with each other with reference to their cost per service-hour, but they scale badly and hold their shape only a comparatively short time.

The cost per service-hour of nichrome carburizing-pots compares with the cost of cast-steel pots, and they are more desirable for other reasons.

The cost of nichrome per service-hour compares favorably with that of cast-steel and on account of the resistance to the action of furnace gases and the extraordinary physical properties which it possesses when heated to moderately high temperatures, the pots can be cast with much thinner sections than those of steel or cast-iron, thereby effecting a saving in time and fuel.

The position of the thermo-couple in carburizing is an all important one. If the time for carburizing is to be taken as 'total time', that is, from the time the pots are placed in until they are taken out, then the thermo-couple should be placed at that point where the pots would be likely to get the hottest. It should not be placed too near the pots, as their mean temperature would influence the pyrometer reading to too great an extent.

We are all familiar with the practice of using test-rods for determining the time at which the proper penetration has been obtained. These are usually of any size up to ½ in. diam., depending upon the depth of case desired, and are bent on the end to facilitate pulling them out with a poker. They are packed in the pot with the work with the hooked end protruding through the luting of the pot. At intervals, after the pots have been in the furnace a sufficient length of time to heat through, they are pulled from the pot and quenched, then broken to determine the depth of case. This method is all right where the pots are covered with clay or cast-iron borings, but does not work so well where the covers are of the same material as the pots, unless holes are drilled in the covers.

A good method is to pack the pyrometer thermo-couple in the centre of one of the pots. This is accomplished by packing a piece of ordinary 1½-in. wrought-iron pipe in the pot along with the work. This pipe should be long enough to show about 4 in. above the pot when the lid is on it. A hole can be drilled in a few of the covers of each style of pot to permit this, and if not used on a pot with a thermo-couple the hole can be plastered shut with clay. When the pots are placed in the furnace the thermo-couple in its protection-tube is put through a hole in the roof of the furnace into the 1½-in. pipe in one of the pots. Around the thermo-couple is placed a piece of 4-in. or 5-in. wrought-iron pipe. This should be long enough to rest on the cover of the pot around the piece of 1½-in. pipe and show about 5 in. to 6 in. above the furnace. The space around the thermo-couple protection-tube inside the larger pipe is then filled with cast-iron borings and jarred into the smaller pipe in the pot. The temperature then indicated, after the thermo-couple has been connected, is the actual temperature of the work. When this method is employed another thermo-couple should be used to indicate or record the furnace temperature. If the second couple is not used there is a chance of over-heating the outer part of the pots, especially if the furnace operator depends too much on the pyrometer and does not observe the temperature of the outside of the pots.

The carburizing temperature and time and whether the articles are to be left to cool in pots or quenched directly from the pots depends entirely on the article, the steel from which it is made, and the depth of case desired.

The temperature of any carburizing work should not exceed 1650°F.

The best practice, in our estimation, is not to exceed 1650°F. on any carburizing work. With the higher temperatures, when a fairly deep case is obtained, to dissolve the excess of carbon is practically impossible when it is desired to leave the articles to cool in the boxes, and the consequent brittleness often leads to more trouble and expense than is saved by carburizing by the increased temperature. For articles made from straight carbon or chrome-vanadium steel, we have found that 1600 to 1650°F. is a good working-range, and on chrome-nickel steels 1550 to 1600°F.

Some pieces made from simple straight-carbon steel, such as nuts, drilling-jig bushings, pilots, balancing-arbors, crank-pins, or the like, can be quenched directly from the carburizing-pots in running fresh water or brine. Other pieces, such as punches for trimmer-presses, drilling-jigs, thin nuts, and bushings, which must be kept fairly true, are best quenched entirely in oil directly from the carburizing-pot. For machine parts where the maximum toughness and hardness must be combined, a better method is to leave the pieces to cool in the carburizing-pot, re-heat to a temperature as high as that used in carburizing, quench in oil, and re-heat again to a lower temperature but high enough to refine the case, and quench in oil or water.

The 'liquid-bath' method of carburizing is used mostly for those parts which require only a superficial hardness.

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

This is obtained by immersion in the liquid bath at temperatures usually between 1400 and 1500°F. for anywhere from 5 minutes to an hour, and then quenching in either oil, water, or brine. There are various forms or processes of the 'liquid' method. The one most extensively used is the 'cyanide' process. By this process the liquid bath is made of sodium chloride (salt), sodium carbonate (soda ash), and either yellow prussiate of potash, potassium cyanide, or sodium cyanide is added to the melt to give the bath its casehardening properties. Of the three forms, the sodium cyanide is the most used for this purpose.

The baths can be made in different ways. One can purchase the salt and soda ash and sodium cyanide separately, or the sodium cyanide can be obtained already mixed and fused with salt and soda ash in the proper proportions.

In addition to being used for casehardening, the cyanide bath is used for re-heating parts for hardening, which have been carburized or made from tool-steel, and which, on account of their character, would go out of shape if heated in a lead bath or muffle-furnace. In this bath the parts are hung suspended either by their own weight on wires or in a basket. The opinion seems to be that when the work is placed cold, or considerably under the quenching temperature, in the liquid bath, the salt immediately surrounding the articles solidifies and remains so until the temperatures of the article has increased beyond the freezing point of the solution, thereby retarding the rate of heating. The same thing, only the opposite phase, and more pronounced, occurs when quenching. The thin film of solution which adheres to the pieces heated in it retards the cooling effect of the quenching medium just long enough, especially in pieces with thin sections, to prevent undue strains being set up in them. This method eliminates the chance of oxidizing the work during heating and when taking work from the heating to the quenching bath, as the work quenched from it is cleaner and more uniformly hard than that obtained by any other method.

Another and more recently developed process was invented by Porter W. Shimer in his laboratory at Easton, Pennsylvania, and was first developed commercially at our plant in co-operation with Mr. Shimer and under the supervision of our department.

In this process calcium chloride and sodium chloride are used as a base and when in a molten state calcium cyanamid is immersed in it to add the casehardening properties. The calcium cyanamid in the form of lumps is immersed in the bath of calcium chloride and salt in a basket or suitable perforated container. Just as the experienced man can tell when the casehardening properties of a cyanide bath are becoming exhausted, so can the properties of the Shimer bath be determined by the activity of the bursting into flame of little gas bubbles which rise to the surface. The greater the number of these little flames and the more violent the bubbling of the bath from the evolution of these gas bubbles the stronger the bath. When the bath is being run at a temperature between 1400 and 1500°F. and the action of these bubbles subsides, it is good indication that the casehardening properties are leaving the bath and it is then that the old calcium cyanimid should be removed and replaced with new. If the pieces taken from the bath are of fair size, they can be broken again, thereby exposing new surfaces of the material and can be used over again the same as new calcium cyanimid.

The commercial applications of this process are practically the same as those of the cyanide bath, with the exception that parts quenched in water or brine from it are somewhat more susceptible to rusting. This rusting, however, can be easily counteracted by a thorough washing in a soda-ash solution.

There are decided advantages in favor of the cyanimid bath and it does not, like the cyanide bath, give off poisonous and obnoxious gases; the men handling it need have no fear of becoming poisoned, and it is considerably more economical.

We have used it exclusively since 1916 in the place of cyanide on all classes of work as a casehardening bath as well as for heating purposes only and are certain, judging from our experience with it, that the process has come to stay. The process is covered by patents, and we understand that Mr. Shimer is about ready to launch it commercially.

The heat treatment usually consists of one or two quenches in either oil or water from temperatures between 1350 and 1650°F., depending on the article and the physical properties desired, and a drawing back, or as some prefer to call it, 'an annealing', to somewhere under the critical temperature.

In those plants where the quantity of any class of work is great enough, this class can be best handled in automatic continuous heating furnaces and quenching apparatus but where there is not enough of any one class of work to warrant an installation of the kind mentioned the problem is different.

A method of handling material such as the last mentioned consists of loading the work on jigs or trays, using furnaces built on a level with the floor, and handling the loaded jigs to and from the furnaces and quenching-tanks with a truck. The jigs are raised in and out of the quenching-tanks with electric cranes on a trolley. Some judgment must be used, however, in the loading of jigs. If the work is piled too high without sufficient spaces between, uneven heating and cooling will be the result.

To ensure uniformity in quenching, whether the medium is oil or brine, there should be plenty of it and some means of circulating or agitating it and maintaining it at a constant temperature.

A method used in the past on oil consisted in running water through jackets surrounding each individual quenching-tank and agitating the oil with compressed air. This method has its disadvantages. When air is used in oil that has become heated, it drives off the volatile matter in the oil and causes what is termed 'fractional distillation'. I have understood that when it is desired in some cases to thicken oil, compressed air is used for oxidizing or thickening it, and it can readily be appreciated

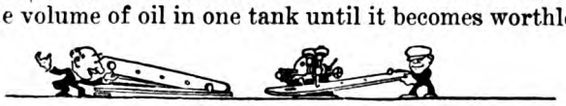
Generated on 2024-09-30 02:12 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

why an oxidizing agent should not be used in quenching-oil. In addition to the injurious effect compressed air has on oil, particularly at high temperatures, the condensation from the air-lines might be great enough to cause the 'boiling over' of the oil when rapidly heated above 212°F. Then, too, for smaller work, the tendency must be considered toward non-uniform hardness of work quenched in oil in which water is suspended, and the effect of cold air coming in contact with the work. By this practice the volume of oil in the tanks is kept at the proper level by the occasional addition of new oil to the old. This is poor practice as there comes a time when the new oil, being such a small proportion of the whole, has little effect on the viscosity of the bath. By this method also the water is not used to the best advantage.

The most efficient oil-quenching system, in point of uniformity in quenching and economy of operation, and one that is being used by many of the larger heat-treating plants, is one in which the oil is pumped from an underground tank through a cooler to the quenching-tanks and allowed to run from there through an overflow back to the underground tank by gravity. The surplus carried in the underground tank should be large enough to take care of the quenching until the whole lot of oil becomes too viscous for use, when it should be discarded and replaced with new oil. The underground tank should be of ample capacity (about the same quantity carried in the underground tank as in all of the quenching tanks should be ample) and placed deep enough to allow for draining the lines. The cooler should be placed between the underground tank and the pump. If the pump is placed between the tank and cooler and the oil becomes fairly hot a great deal of trouble is usually experienced with the pump bearings and packing.

The most efficient oil-quenching system is one where the oil is pumped from an underground tank through a cooler to the quenching-tanks and allowed to run back to the underground tank by gravity.

Such a system serves as a means of maintaining the entire volume of oil in the quenching-tanks at a uniform temperature, agitating the same in the tanks (the cold oil is forced in at the bottom of tank and the hot oil runs off at the top through the overflow) and of taking care of the volume of oil in one tank until it becomes worthless.



One of the recent recruits to the Army, a raw-boned Arkansan, was undergoing his examination by a lieutenant on the insignia worn by officers of various grades.

"What do two silver bars mean?" queried the lieutenant.

"Cap'n."

"One gold bar?"

"Second loot'nant."

"Silver eagle?"

"Well, I ain't right sure about that one," he confessed, "but I reckon I'd take a chance and salute him anyhow."—Home Sector.

German Machine-Tools in Allied Countries

An observer, who has recently made a study for the California Manufacturers Association of the extraordinary conditions in Holland and Belgium, particularly with reference to offerings of German machine-tools at prices far below those current for American tools, has just submitted the following report to J. R. Millar, president of that organization:

"I have only just returned from the Continent, where I have visited Holland, Belgium, and France. At first sight, and judging by what one hears, the impression that one would get of German competition is that it would be hard to meet, but it seems to me that on closer examination the situation over there assumes a more cheerful outlook. Holland, it is true, is full of German machine-tools which had been sent over soon after the ending of the War in the hope that good business might be done in the devastated sections when they began reconstruction. This speculation in German tools was also augmented by the fact that the German mark was very low and the machines could be had comparatively cheap with Dutch money. It was found later, however, that it was not such an easy matter to import machines of German origin into the Allied countries, and a good many of the owners of the German equipment have been rather disappointed.

"Among the German machine-tools there is a lot of junk which a good many people will not buy. Of course machines can be had so cheap that in many instances tools are bought that are not exactly what a client would buy if purchasing new machines. It might interest you to know that when it comes to the purchase of German machines that are not in stock we are in a much more favorable position. German deliveries are usually indefinite, and the prices also. The prices are subject to many conditions, such as the increased cost of labor and the liability to have to pay future export duties, which the Government threatens to levy, and has levied recently. German deliveries are contingent on their being able to obtain certain raw materials that are indispensable, and buying a machine in Germany for future delivery is rather a risky proposition.

"During my recent trip to Belgium we received several large orders from a customer who led me to believe at first that there was no chance of our doing business on account of the considerably lower prices he could get in Germany. I was sure that his offers were not bona fide and on examining the proposal more closely it came out that neither the price nor the delivery were very definite.

"Taking the matter as a whole, business will be considerably reduced because of the large number of German machines that will be offered during the next year or two, but there will always be a certain number of cases where high-grade American tools will be purchased, and I am optimistic enough to believe that we will be doing a steady, although smaller business for some time to come."

Generated on 2024-09-30 02:08 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Mechanical Features of the First Transcontinental Motor Convoy

An article appearing recently in the 'Journal' of the American Society of Mechanical Engineers by E. R. Jackson describes the trip made last summer from Washington to San Francisco by the motor convoy sent out by the War Department. Lieutenant Jackson accompanied the convoy as ordnance observer. The convoy left Washington July 7 and, following the Lincoln Highway, reached San Francisco September 6, only five days behind schedule, in spite of encountering many difficulties on the unimproved roads that comprise most of the route from Omaha west.

Te following general conclusions are given by Lieutenant Jackson based upon his observations during the trip:

Cooling-Systems. The vertical tubular type of radiator, with bolted-on upper and lower tanks, is the most satisfactory for military vehicles, because of the facility with which it may be cleaned and repaired. The addition of a temperature-regulator in the water-line, which would restrict the flow of water until the motor had become warm, such as is now standard equipment on many commercial trucks, would be desirable. Such a device is simpler and less expensive to install than radiator-shutters, less liable to damage, and is automatic in its operation.

An endless flat fan-belt, of leather or rubberized fabric, is most desirable for military motor vehicles, and an effort should be made to standardize the width and length of these belts. An extra endless belt should be carried in each vehicle at all times. The 'V' fan-belts are not desirable, but if used, some form of a dust pan should be placed in front of the lower fan-belt pulley to protect the 'V' belt.

Motors. Because of the large proportion of failures experienced with certain valve-tappet rollers and guides and also the valve-springs, prompt attention should be paid to the development of a more durable valve-lifter assembly, which will be interchangeable with that now in use. It is suggested that steel be used in the construction of the guide instead of cast-iron, as at present, and that the valve-springs be heat-treated more carefully.

The governors of all trucks in the convoy were rendered useless during the first few days of the trip, causing later many burned-out connecting-rod bearings, on account of speeding the vehicles. Some means should be provided to protect the governors against tampering on the part of drivers and mechanics.

A simplified carbureter would be advantageous on cars having a sensitive automatic throttle and auxiliary air-valve, as these are not thoroughly understood by the average mechanic.

Only the best grades of oil should be used in motors, and a simple and positive means of determining the oil-level should be provided on every truck.

A study should be made of the conditions responsible for the blowing out of cylinder-head gaskets in the motor of the standardized Class B trucks, and such changes made as may be necessary to eliminate this trouble.

The mufflers on some of the trucks were found to clog easily and this matter should be given careful attention.

Ignition and Electrical Systems. The Bosch magneto used on the standardized Class B truck should be corrected to have a greater air gap between the pencil and the distributor-block.

The present acetylene headlights used on all trucks are inadequate, and the carbide generators are unsatisfactory and poorly constructed. It is believed that an efficient system of electrical lighting should be adopted for all military trucks. Such a system was developed for the Ordnance Department during the War by R. M. Newbold and found satisfactory.

The use of mechanical or electrical self-starters on military vehicles is undesirable, as they merely add complications to the operation and maintenance of the trucks.

All service-cars should be equipped with four electric spot-lights for night repair-work.

Fuel Systems. Except for a few broken gasoline-lines the fuel systems now in use were found generally satisfactory, although larger drain-cocks in all gasoline tanks would be desirable.

Transmission Systems. A driving-worm of 24 pitch instead of 33⅓ pitch is recommended for all Class B trucks. Of the three Class B tankers, the one with the 33⅓-pitch worm was the one which was most frequently stalled.

Steps should be taken to have all future military motorcycles equipped with a complete protective guard around the drive-chain system. A unit power-plant, eliminating the short drive-chain, is also desirable. In future development steps should be taken to eliminate the chain-drive entirely and to substitute shaft-drive. There are no insurmountable difficulties to the inclusion of this type of drive in a motorcycle, but it cannot, however, be applied when the V-type two-cylinder motorcycle motor is used.

Chain-driven trucks cannot be operated satisfactorily where soft, sandy, or muddy roads are encountered. They are essentially good-roads trucks. As an automotive principle the four-wheel drive was vindicated by the Militor and the F. W. D. trucks. It is believed that the Militor is the most powerful wheeled motor vehicle constructed up to the present time.

Vehicle Controls. The steering-gears gave little trouble,

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

but better lubricating facilities are desirable to secure the ease of steering so necessary on a motor truck, especially on heavy roads, as some types are hard to operate on rough roads.

On one class of trucks the brake-rods are placed too close to the springs and there is frequently wear between these parts.

Front Axles. There were no front-axle troubles due to any inherent mechanical faults.

Rear Axles. No serious rear-axle trouble developed on the road other than stripping some teeth out of two ring-gears in one make of car. All worm-gears operated without any signs of overheating under the heaviest pulls. Increased ground-clearance under most rear axles would be very desirable.

Wheels and Tires. All trucks for military use should have cast-steel wheels; and passenger automobiles for the army, wheels of the pressed-steel disk type.

Solid tires for trucks should be of the giant instead of the dual type, as the giant type gives better traction and apparently stands wear better than the dual type. This was especially noticeable in the deserts, where a ridge of sand was pressed in between the two halves of the dual tires, virtually eliminating the ground pressure of the tread, and thus reducing the tractive effort. Furthermore, manufacturers have practically ceased production of dual tires and are centring all their energies upon the construction of giant tires.

Chassis. The frames of all vehicles completed the journey with no apparent damage. All frames were in alignment and only one case of deflection was observed. Rear bumpers should be placed on all trucks, and a stronger bumper, possibly with steel facing, should be used on military vehicles. Many towing-hooks straightened under pull. A much stronger hook should be developed.

Bodies. In two makes of 1½-ton trucks the body-sills had to be cut in order to give wheel-clearance and attention should be paid to this matter.

Tankers are overloaded and the centre of gravity is too high. Slush was responsible for one overturning. Bumper should be in rear of faucets to protect them.

Whenever a train is started out for other than experimental purposes the trucks should be of the same type and tonnage, thereby eliminating the number of spare parts to be carried.

The maintenance and repair of the convoy-vehicles was the principal function of Service Park No. 595, comprising 1 officer and 38 enlisted men, and the fact that of the 81 motor vehicles in the convoy, only 3 were retired from service en route shows that this work was well done. Included in this detachment were machinists, welders, painters, blacksmiths, and carpenters, as well as men especially expert on repairing particular parts, such as carbureters and magnetos. These men frequently worked all night in order to have some truck ready to run under its own power when the convoy broke camp in the morning. New connecting-rod bearings were fitted, damaged cylinder-blocks repaired, cracked crank-cases repaired, new clutch assemblies installed, and even babbitt bearings poured by the roadside with satisfactory results.

The maintenance work was considerably hampered because of the necessity of carrying spare parts for so many different makes of trucks, and the additional fact that the stock carried had not been selected intelligently. Large stocks were carried of such parts as axles and drive-shafts, among which there were no breakages, while no spares whatever were taken of many other parts such as radiators, on which there were frequent failures. In a few instances it was possible to replace a broken or worn part in one truck with a spare part for another make of truck, when careful calibration showed the dimensions to be practically the same.

Welded High-Pressure Steam-Manifolds

The manufacture of high-pressure steam-manifolds by the oxy-acetylene process has become standard practice in the shops of an important Pennsylvania engineering company.

The construction of such manifolds by oxy-acetylene welding and cutting provides not only an easy method of manufacture, but gives great strength and pressure-resisting qualities.

In welding one of these branches a piece of 4-in. steel pipe 18 in. long is used. The centres for the sleeves are marked and holes cut by a cutting-torch. Then the first socket is aligned and welded, others following until the job is completed. Nipples are placed in the sockets in order to protect the threads during welding.

Following the welding of the sockets, disks of the proper thickness are cut and welded in each end of the manifold. These disks are chamfered, so that when placed in position in the manifold the necessary bevel or 'V' for a strong weld is secured.

To weld a manifold complete takes about two hours. Approximately 80 cu. ft. of oxygen and 70 cu. ft. of acetylene are required for each job.—Acetylene Journal.

Pre-Heating in Carburizing

In an article recently appearing in the 'Journal' of the American Steel Treaters' Society, T. G. Selleck advocates pre-heating in carburizing. He mentions a particular case in his own experience, where plates up to $\frac{9}{16}$ in. thick were treated in this way. The regular furnace-charge was seven plates, weighing 100 lb. each. The average time required to bring the plates to a temperature of 1500°F. was one hour, which was the pre-heating period. In previous work, before pre-heating was practised, the average time to bring the charge to that temperature was 13 hours. The introduction of the carburizer reduced the temperature of the metal about 300°F., but did not spoil the uniformity of the heating, and there was a net saving in time of operation of about 50%, while a considerable saving of carburizing material was also made. The greatest advantage, however, was increased uniformity of penetration and carbon content.

Generated on 2024-09-30 02:07 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Signals for Indicating Heating of Bearings

In an article appearing in the 'Journal' of the Chemical Society, H. T. Pinnock, discusses the various devices that have been proposed for indicating automatically when a bearing approaches the danger point in heating. Indicators operated by electric thermo-couples or based on some expansion method have been devised, but more satisfactory results have been produced by the use of the double iodides of mercury with other metals, which possess the property of undergoing a reversible transition involving change of color when heated and subsequently cooled.

Two compounds were eventually prepared which gave promise of considerable utility. The first of these was the double iodide of silver and mercury, $AgI\ HgI_2$, which is a pale lemon-yellow powder at ordinary temperatures, and changes to a vivid carmine color at about 90° to 100°C., the change in both directions being fairly sharp. The other was the copper mercuric iodide, $Cu_2I_2 2HgI_2$. This substance is a vivid scarlet-vermilion at ordinary temperatures and at 60° to 70°C. it changes to a chocolate-brown. Both these compounds are adapted for use under suitable conditions, but it was found that a mixture of the two, consisting of 85% of the copper salt and 15% of the silver salt, was more sensitive and gave a greater color range from vermilion to almost black, the transition being exceedingly sharp.

The compounds may be prepared in a variety of ways. A simple method of preparing the copper salt is by well triturating in a mortar 380 grams of cuprous iodide with 910 grams of mercuric iodide, sufficient water being added to form a paste. When thoroughly mixed, the mass is dried in the water-oven, and the dried mass ground to an impalpable powder. Another method is to dissolve the mercuric iodide in excess of potassium-iodide solution and precipitate the double salt by the addition of copper-sulphate solution. The silver salt can be prepared in a similar manner by double precipitation. Whichever method is adopted the product should be well washed to eliminate soluble impurities, as these appear to retard the color-change, as well as to affect its character.

To apply the mixture convert it into a varnish paint or enamel, by incorporating the powder with a colorless varnish medium that will stand moderately high temperatures without softening. A good white-shellac spirit-varnish such as is used on electrical machinery has been found suitable for most occasions, but for high temperatures a medium such as is employed in the high-temperature aluminum paints used for steam-pipes, and which will resist temperatures up to 200°C. is preferable. About 100 grams of compound to 70 cc. of medium will be found a mixture of suitable consistence.

A convenient method of applying this heat-detector is first to paint a white circle or ring on the bearing or other place which it is desired to keep under observation, using a zinc-white paint. This white circle is applied to the journal or housing of the bearing, and the detector-paint is applied as a vivid red bull's eye in the middle of this, thus forming a striking object which is visible from considerable distances. It must be applied to the block of metal as near as possible to the point at which the heat is likely to be generated. It is sometimes desirable to apply the paint to the shaft itself, just where the latter extends beyond the bearing-metal. A convenient method is to apply a broad band of white paint with a narrower band of the red detector-paint in the middle. This red band in the middle of the white one is easily seen as the shaft rotates. In any case, after the paint is dry it should be protected with a coat of colorless oil-proof varnish, so that the surface may be occasionally wiped free from dust and dirt. The visibility of the paint against its white background is high, the bright scarlet color being visible from long distances without effort, and the change at 60° to 70°C. to black is easily observed. It is generally easy to arrange matters so that the detector is placed in a position where it is visible almost without conscious effort; and experience has proved that a workman is easily trained to cast his eye occasionally on the detector, while he could not be depended upon to climb to the spot and feel the bearing on the remote chance of finding it heating. When the paint changes color there is something wrong with the bearing, but generally speaking it will be found that the matter is taken in time, and that no damage is done, the bearing simply requiring cleaning and adjustment without serious stoppage and expense.

Hydro-Electric Development in France

Crippled transportation facilities and the shortage of coal in France has compelled many factories to move nearer the source of their raw materials, and particularly nearer to natural water supplies, for power purposes. Already many textile factories have been transferred from the long established textile centres of Roubaix and Turcoing to the environs of Grenoble in the Alpine district. Flourishing iron industries also have moved. Before the War, a project had been formed for the exploitation of the water power of the Savoy Dauphine district. Its success at present seems assured. Factories employing 570,000 hp. are now operating in the district and others are under consideration that will require 250,000 hp. more.

Congestion of the Parisian industrial centres is another problem that the manufacturers are facing in re-establishing their industries on a peace-time basis. The industrial population at Lyons tripled in a little more than two years. The American Red Cross, by welfare work among women and children, has done much to relieve the hardships bound to result from such an unprecedented influx.

Generated on 2024-09-30 02:07 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Market for Agricultural Machinery in Asia Minor

According to George Horton, U. S. Consul at Smyrna, Asia Minor is probably the world's greatest potential market for agricultural machinery. This region, during the whole period of history from earliest known records down to the advent of the Turks in the thirteenth century, was one of the world's garden spots. Its fruitful plains and extensive river valleys raised crops of every kind of temperate and semi-tropical fruits, vegetables, and cereals, which supported millions of people and the great Ionic Greek and Eastern Roman civilizations.

With the coming of the Turk, the region declined in importance, though it remained and still is, under all handicaps, the granary of the (former) Turkish Empire. The tillers of the soil who were successful were the Greeks, and to them is due the little progress that occurred in Asia Minor. Much of the land was in large estates owned by the Turks who farmed them out in small parcels to the peasants, and who had no interest in the development of their land, being content so long as the rents and taxes were paid regularly. This attitude of the great landowners, the Turkish system of taxation, and the Ottoman objection to all innovations made the development of Asia Minor difficult. Brigandage was rife everywhere, discouraging the introduction of foreign capital, which would have been eager under a stable government to invest here. The few large Greek or foreign landowners who were anxious to introduce the use of modern agricultural machinery and methods were prevented for the most part from employing modern implements either by lack of security or, in many cases, especially just prior to the War, by actual destruction of the machinery after its arrival.

Conditions today are completely changed. The Greek mandatary administration is heartily in favor of the freest and most advanced development of Asia Minor. Security now prevails through a large part of the occupied territory. The Greeks are enterprising, and they want modern machinery. There are many immense tracts of level stoneless land awaiting the plow. The Greek government has expressed its intention of buying 20,000 horse and ox plows for the use of peasants of all races when these return to their farms, whence they fled; 6000 plows are wanted at the earliest possible moment. The order for plows will be probably handled by one large American firm, which produces certain types familiar to the peasants of Asia Minor. However, it is suggested that there is still a good chance for other American firms, who are advised to send descriptive literature, quotations, etc., either to the Greek High Commissioner, Smyrna, or to the American Consul at Smyrna, for delivery to him.

As to the introduction of tractors, a resident American citizen has a farm of 20,000 acres on the railroad 17 miles from Smyrna and has offered a part of the most fertile land for use as an experiment station. The Greek mandatary administration is to give practical demonstrations here of American tractor machinery, and is willing to place a trial order for six or more tractors, paying cash at New York. If this demonstration is made successfully, it is certain that the Government will buy several more machines, and the owners of estates will also. The American Consulate at Smyrna is anxious to carry through this plan, as it should result in big business in this great, rich, undeveloped region, but it cannot be successful if American companies do not co-operate. As in the introduction of tractor machinery in Old and New Greece, it is necessary that the companies send out experts to set up and run the tractors and to teach the natives how to handle and repair them. Before the War and during the struggle, German and Austrian manufacturers were accustomed to send an expert with one machine. They were after the business and the only reason they did not succeed was because they did not have the goods to compete with American makes. When peace conditions are re-established, they will be represented here again, and will take advantage of any inaction of American companies. Already British agricultural-implement companies have representatives on the ground here. American agricultural-implement companies should look the facts squarely in the face and sacrifice a part of their present profits for the sake of a big future business. If they will do this, American machinery will develop the lands of Asia Minor, the country will again become one of the world's greatest granaries and garden spots, and America's prestige in business matters will be as high as its reputation for justice and fair dealing in the Near East.

WITH a keen eye on dramatic effect the ambitious candidate for the job of member of Parliament faced his audience.

"Like you, my friends," he said, "I am a horny-handed son of toil, and here are the tools I used."

As he waved a trowel and a hammer in the air, he went on:

"Two years ago I was a working bricklayer, and, although prosperity has smiled on me, I still treasure the implements which brought me my bread and butter."

Wild cheers greeted his statement, and the tools were handed around for inspection. The candidate thought to make his point more telling with the explanation:

"Brother workingmen, can I rely on your support?"

"You can that!" exclaimed a man who was examining the tools, with an air of awe. "A chap who can lay bricks with a gardener's trowel must be extry clever!"—London Answers.

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Overcoming Opposition to Physical Examination of Workers

There is a growing attitude of opposition among labor unions to the physical examination of industrial workers, according to Dr. C. D. Selby in an article on 'Reclaiming the Physical Examination of Industrial Workers', published in 'Modern Hospital'. The author divides the problem presented by this attitude into three phases and analyzes the phases in their practical relations to the workers, the employers, and the industrial physicians. It is the latter, however, upon whom he places the responsibility for the existence of conditions which have led to this attitude as well as for readjustments which would bring about a more generally effective medical examination and supervision service, the value of which they should demonstrate to both employers and employees.

The opposition of the labor unions to physical examinations is ascribed to the rejection of applicants for employment, rejection having been the only effect of such examinations which the unions seem to have observed. Dr. Selby believes that physicians are partly responsible for this, since they have not measured up to what industry was led to expect of them in the way of fitting men to their jobs and helping them to correct physical defects. Consequently, the outstanding result has been the rejection of those who were deemed physically disqualified. 'Inasmuch as physical examinations are essential to the betterment of health among working people, efforts to offset this growing antagonism would seem to be not only justified, but urgent as well; otherwise the whole movement of industrial health supervision may fall.'

It is suggested that the first step in settling the problem is to satisfy the unions. This would require:

"First, that the number of rejections be reduced to the minimum; and second, that means be provided for (*a*) the industrial rehabilitation of the essential 'rejects' capable of restoration, and (*b*) the pensioning or institutionalizing of those who are not.

"To reduce the number of rejections it is imperative that industry be induced to absorb more of the physically handicapped workers than it now does, which is difficult to acomplish. In the first place, compensation acts tend to place full responsibility upon employers for the results of injuries to such workers even though pre-existing conditions may have been largely responsible. Furthermore, handicapped workers may or may not be competent, depending upon (*a*) the skill of physicians in interpreting their physical values, (*b*) the judgment of employing officers in assigning them to jobs, (*c*) the special facilities they are furnished for work, and (*d*) the quality of supervision they work under. In other words, handicapped workers require special and unusual attention and facilities in order that their labor may be used with advantage and to the profit of their employers. Few employers care to go to this effort and do not attempt to if they can maintain their working forces without."

Under existing conditions, only a shortage of labor will induce the average employer to hire handicapped workers, declares the author, but he thinks that if employers could be assured of relief, in case of injury, from the whole responsibility of results due to pre-existing conditions, they would be willing to hire physically defective workmen. In order that the number of rejections be reduced, compensation acts must be "so modified as to relieve employers from at least a part of the responsibility of results of injuries that are influenced by conditions beyond their control and for which the employees themselves are responsible".

The second phase of the problem is to make it easier for employers to utilize the labor of handicapped workers to advantage and with profit. The greatest responsibility in dealing with this phase lies with the physicians, and the author thinks that, in general, physicians have, so far, fallen short of fulfilling possibilities open to them for the greatest service; that "industrial physicians recognize and believe in the theory of fitting men to their jobs, but fail in the majority of instances in its application".

"Industrial physicians must demonstrate to their employers that not only handicapped workers may be competent if properly employed, but that likewise all workers will be more competent if they also are fitted into jobs they are physically adapted to.

"At the present time it is doubtful if physicians are prepared to do this, for something more than a mere conception of physical values is required, and this is a knowledge, a very intimate knowledge in fact, of working conditions. Industrial doctors must be prepared to advise intelligently and convincingly on the hiring and placing of all employees whether impaired or normal, and to do so they must study each operation in their plants, classifying and codifying the physical requirements of each so that their knowledge of working conditions is instantly available.

"Studies of this nature need not be of an ultra-scientific character. On the contrary a few simple observations are all that are necessary. For example, consider the physical requirements of iron-molding in a fairly dusty foundry. The workman must have (1) no disease of the respiratory tract, (2) no heart or vascular disease, (3) no hernia; he must be (4) 5 feet 8 inches tall, and (5) fairly strong (as indicated by his musculature); he must have (6) good back action (for lifting), and (7) sound extremities. Then take the man in the same foundry whose business it is to weigh the castings. About the

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

only requirement to be expected of him is that he have sufficient eyesight to read the scales. He could be ruptured, have high blood-pressure, and what not—it matters little."

The third phase of the problem suggested by Dr. Selby is concerned with the physical supervision of the handicapped workers after they are placed. The men should be looked up from time to time by the physician to see what effect the work has on them. Not only does this enable physicians to advise handicapped workers if they are doing harm to themselves, but it enables them to do their own work more competently. It is suggested, in this connection, that examining physicians should be expected to spend some time each day in their plants for the purpose of observing impaired workers at their work. Such workers should be required to report for further examination occasionally, particularly in connection with their impairment.

The author mentions the industrial rehabilitation of essential 'rejects' capable of restoration and of the pensioning or institutionalizing of those who are not, commending to students of sociology and particularly to those who are interested in the sociological phases of hospital work the problem presented by this subject. Dr. Selby's conclusions are as follows:

"Two essential thoughts concerning industrial physicians have developed out of this brief study. They will be emphasized in closing. The first is that the doctors of industry must study working conditions and apply the information they gain therefrom to the practical fitting of men to their jobs. The other is that industrial physicians must, absolutely must, exercise more in the way of physical supervision after the men get on their jobs. These two measures are imperatively necessary if the physical examination is to be saved from the antagonism of labor, and as a matter of fact they are quite essential to the proper pursuit of industrial hygiene. The opposition of labor should not be required to stimulate physicians to do what is very properly their self-assigned but greatly neglected task."

In an early draft, relates the Home Sector, there was sent to one of the cantonments a man who had no objections to serving in the army, but protested volubly against being sent to France on the ground that he had a brother in the Austrian army and did not wish to be responsible in any way for his death. While his case was being investigated at headquarters he received the usual training in squads right and wrong and the manual of arms.

The very touch of the rifle and bayonet seemed to increase his conscientious scruples, so that, before executing any movement, he would blurt out: "But I do not want to learn this. I do not want to kill my brudder."

The sergeant stood it as long as he could, but finally, his patience becoming exhausted, he shouted:

"Say, you, you don't need to worry about that. I'll kill your brother for you."

Recovery of Copper and Tin From Brass and Bronze

Just how the German metallurgists succeeded in obtaining or recovering copper from its alloys, brass and bronze, to replace the copper shortage during the War has been very interestingly revealed by a leading German metallurgist.

The problem was to obtain a pure copper from the miscellaneous alloys which the mobilization of copper brought in. Several copper refineries were built in Germany and Austria, notably by the Siemens companies. The brass utilized comprised door-brasses, candlesticks, picture-frames, taps, weights, crucifixes, etc.; the brass was melted down, the zinc oxidized, and the crude copper cast into anodes and treated in the electrolytic refineries. The requisition of bronzes, largely church-bells, followed that of brass. The disintegration of the heavy strong bell-metal gave some trouble; the bells were inverted, filled with water and then shattered by exploding cartridges in the water. The bronze was then fused into anodes for electrolysis. The accumulation of stannic acid in the anode-mud and in the electrolytic disturbed the electrolysis, and some copper was first lost and recovered contaminated with lead and other impurities; those difficulties were, however, eventually overcome.

The recovery of tin was another difficult problem. Germany possessing hardly any tin ores, the stannic anode-mud had to be reduced to tin, and special attention was further paid to the recovery of tin from bearing-metal. Two works were built to work up old bushings, and it is said that they have been very successful, and that some works have also managed to economize tin by adopting electrolytic processes in their tin-plating shops. That zinc and aluminum have widely been used in the electrochemical industry has been mentioned on other occasions. There has been no important modification of the aluminum process. But the foreign supply of bauxite was stopped, and the best use had to be made of the bauxite stores of Carinthia, Hungary, and Dalmatia and of superior clays in other parts of the central states. Reliable particulars about the purification of clay have not yet been published.—Scientific American.

Market for Machinery in Japan

Consul Robert Frazer, Jr., of Kobe, reports that 80% of the machinery imported into Japan in 1918 came from the United States, 16% from Great Britain, and 4% from other countries. The total value of such imports was $29,248,999. In the order of importance they consisted of the following classes: Spinning machinery, steam-boilers and accessories, metal and wood working machinery, dynamos, electric motors and transformers, sewing machines, gear-cutters, paper-making machinery, gas-compressors, pumps, pneumatic tools, weaving machinery, iron rollers, gas and petroleum engines, steam-engines, cranes, capstans, and locomotives and tenders.

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Trade With South America and the Orient

A statement prepared recently by the Bureau of Foreign and Domestic Commerse shows that, while the balance of trade in favor of the United States in 1919 reached the record figure of $4,017,744,265, if the commerce with Europe were excluded, the balance against this country was $417,666,301. This excess of imports over exports in commerce with the rest of the world is largely because of the increasing amounts of crude materials and foodstuffs imported chiefly from the tropical countries of South America, Oceania, and the Orient, which are to a great extent non-competing with the products of the United States. Other things being equal, it would seem that these countries offered the best field for expansion in foreign trade for the American manufacturer of machinery or other goods, since the financing of such trade does not present the same difficulties as does trade with a country where the trade balance is already unfavorable.

A valuable trade is being built up between the Central American States and this country, imports for 1919 amounting to $43,149,859, as compared with $44,131,122 in 1918, and exports to $55,642,956, against $40,899,065. Nearly one-half the total export trade with these States in the past year was with Panama.

Notwithstanding the tremendous growth of South American trade with the United States during the war period, the peace year 1919 shows larger totals than ever before, although the carrying trade with Europe has been re-established and the nations of the Old World are again seeking markets for their manufactured goods in South America and bidding for its raw materials and foodstuffs. Wool imports fell from $128,921,326 in 1918 to $61,674,-531, and not a bushel of wheat arrived in the United States from Argentina in 1919. There was a tremendous drop in Chilean nitrate imports, no longer required in munitions manufacture. These items largely account for the decline in imports from the countries named.

Other large gains in imports last year over 1918 were from Venezuela, $20,153,561, Colombia, $18,188,374, and Uruguay, $14,900,612; while a decline is registered in receipts from Chile of $83,640,556, from Peru of $1,311,-673, and from Ecuador of $1,155,399. In addition to the tremendous increase in the total value of shipments to Argentina and Brazil, exports from the United States to Colombia, Uruguay, and Venezuela were approximately doubled for the first peace year, as contrasted with 1918 returns, with less notable export gains in the trade with some of the other South American countries.

Although European competition for the Eastern markets is reviving, the United States in 1919 received an important share of the trade from the Antipodes. As compared with 1918, imports from Aden, China, Chosen, the East Indies, Japan, and all other Asiatic districts except Hongkong show large increases; while, with the exception of a slight decline in shipments to Hongkong and Portuguese East Indies, increased exports to all other nations of Asia are noted. The upward trend in exports is equally apparent in the trade with Oceania, but there was a heavy drop in imports from Australia and the Philippines.

The growth in the trade with Japan which followed the outbreak of the War continued through the first peace year, with imports forming 40% of the total imports into the United States from Asia and exports constituting 52% of the total exports from the United States to Asia. As compared with 1918, imports gained $107,-910,155 and exports $92,589,908 in 1919. Imports from Japanese leased territory of China during the past year show a decline of $14,342,894 from the previous year, but exports practically doubled.

China in 1919 took increasingly large amounts of American cotton goods and other manufactures in exchange for its silk, tea, and other leading products. Imports increased by $43,182,782 over 1918 and exports gained $52,944,383.

Like China, the vast territories of the British East Indies seem to offer unlimited opportunities for further trade extension to American merchants. Imports in 1919 exceeded by $23,039,666 those of 1918; the gain was chiefly in the trade with India, imports from the Straits Settlements declining by $4,368,975. Exports to the British East Indies increased from $51,354,855 in 1918 to $81,514,358 last year, representing an increase in shipments to India of $27,113,070, to the Straits Settlements of $2,186,014, and to other British East Indies of $860,419.

The most important features in the trade of the United States with Oceania were the declines in imports from Australia and the Philippines, though the exports largely increased. Imports from Australia show a falling off of $15,360,871; and from the Philippines one of $19,637,381; exports to the former country show a gain of $15,534,861 and to the latter one of $17,334,590.

A PARTY of tourists was standing on the rim of the crater of Mt. Vesuvius. One member of the party was overwhelmed at the sight below him. He stood there for several minutes watching the boiling lava and seemed wholly oblivious to the fact that there was anyone else around.

"That beats hell," he said to himself, but loud enough for all to hear.

An English woman in the party turned suddenly in surprise, and putting her glass to her eye, stared at the American curiously.

"My word!" she remarked after a short pause. "How extensively these Americans have traveled."—Columbus Dispatch.

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

By-Product Coke-Ovens of the Granby Consolidated Company at Anyox, B. C.*

By W. A. WILLIAMS

The Granby Consolidated Mining, Smelting & Power Co. is the largest producer of copper in British Columbia and consumes an average of 250 tons of coke per day. Beehive-oven coke was formerly bought, and the shipments were often considerably delayed and the proportion of breeze was excessive, causing great inconvenience in the operation of the smelter. To secure a more reliable supply, the company decided to produce its own coke. A modern coal mine was put in operation at Cassidy, a few miles from Nanaimo on Vancouver island, and a coking-plant built at the smelter. The coal is screened at the mine, the marketable sizes sold, and the slack washed and shipped to the coking-plant.

Barges holding about 2000 tons carry the washed slack to the coke-plant, where it is unloaded by a steam-hoist operating a one-ton bucket having a capacity of 120 tons per hour. The bucket is emptied into a hopper, from which the coal is carried by a 30-in. belt to the top of the 12,000-ton storage-bin, where it is distributed by another belt running along the top of the bin. The bin, built entirely of wood, is 300 ft. long and 51 ft. wide, with a V-shaped bottom. From the bin, the coal is taken by belt-conveyor and elevator to the crusher, which is one of the swing-hammer type and has a capacity of 50 tons per hour. The coal is crushed so that at least 90% will go through a ¼-in. screen and 80% through ⅛ in. A bucket-conveyor takes the coal from the crusher to the 500-ton bunkers over the ovens. The coal is drawn from the bunkers into a lorry equipped with four cone-shaped hoppers, the combined capacity of which is 13 tons, just sufficient to charge one oven.

The 30 ovens, having a capacity of 270 tons of coke per 24 hours, were designed by the Gas & Coke Oven Co. of America. Their special feature is the substitution of vertical flues for horizontal flues. The dimensions of the coking-chambers are 37 ft. 4 in. long, 9 ft. 10 in. high, 18 in. wide at the pusher side, and 21 in. at the coke side, with a capacity of approximately 13 tons of coal. Regenerators are situated under the ovens, one regenerator-chamber under each oven. A heavy wall separates the regenerator-chambers from each other and upon this wall rests the oven-heating wall. This oven-heating wall is made up of 30 vertical flues, each two adjacent flues forming a complete unit. Situated beneath these vertical flues are two ducts that feed gas to them through removable nozzles. These horizontal ducts are so divided that 14 of the vertical flues receive their gas from the coke side and 16 from the pusher side. The regenerators are connected to waste-heat flues paralleling each side of the battery, and are so divided as to furnish air to, and receive the products of combustion from, these flues, receiving gas from the same side.

The regenerators are divided into an upper and lower section by means of a horizontal partition extending from the front of the generator chamber to within 18 in. of the back wall. Thus any tendency of the air and products of combustion to short-circuit is avoided and their travel increased. The efficiency of the generator system is greatly augmented by having this regenerator-chamber, through which the combustion air is being drawn, sandwiched between regenerators, through which the products of combustion escape, thus effecting what might be called a combined regenerative and recuperative system.

The pusher was built by the Atlas Industrial Car Co. of Cleveland, and comprises door, extractor, pushing-ram, and leveling-bar. The coke guide and door extractor on the coke side are hung from an overhead track. The quencher-car, with its load of red-hot coke, reaches the quenching station; the water is automatically turned off when the car leaves the station. After quenching, the coke is taken directly to the screening-station where it is separated into furnace and breeze coke and loaded directly into cars. The handling is greatly facilitated by the fact that, owing to difference in elevation of the quencher and loading-tracks, the cars are loaded by gravity.

The gas is reversed each half-hour, burning in one flue of each unit for half an hour, and in the other flue for the next half-hour. Thus we have combustion taking place in every alternate flue the whole length of the oven-wall. The size of the opening connecting the two flues comprising a unit is regulated by a slide-brick, thus controlling the air-supply to that particular unit. Above each flue is a hole through which the condition and temperature of the wall may be observed. The openings leading from the regenerator to the stack-flues are provided with dampers so that the draft to each regenerator may be regulated.

The incoming combustion-air is regulated by the use of finger-bars. There is a damper in each stack-flue just before they unite into a single flue at the stack-end of the ovens. The single flue that leads to the stack also contains a damper. The stack is built of radial brick. It is 177 ft. high and 9 ft. 8 in. diam. at the bottom and 7 ft. diam. at the top.

The gas is conducted from the oven-chamber through 14-in. cast-iron ascension pipes to the collecting main, which is 4 ft. 4 in. wide, and 4 ft. 9 in. deep at one end

*A paper read before the Canadian Mining Institute at Vancouver on November 27, 1919.

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

and 5 ft. 8 in. deep at the other, with a semicircular bottom. The uptake main is 28 in. diam. and continues just beyond the bunkers, where it enters the downtake, which is 24 in. diam., and thence along the ground by the by-product building.

A hand-valve to control pressure in the collecting-main is placed just before the downtake. The temperature of the gas is considerably reduced in the collecting-main and the heavier particles of tar and liquor condense and escape as a liquid. To keep the main free from thick tar and pitch, fresh tar is continuously circulated through it.

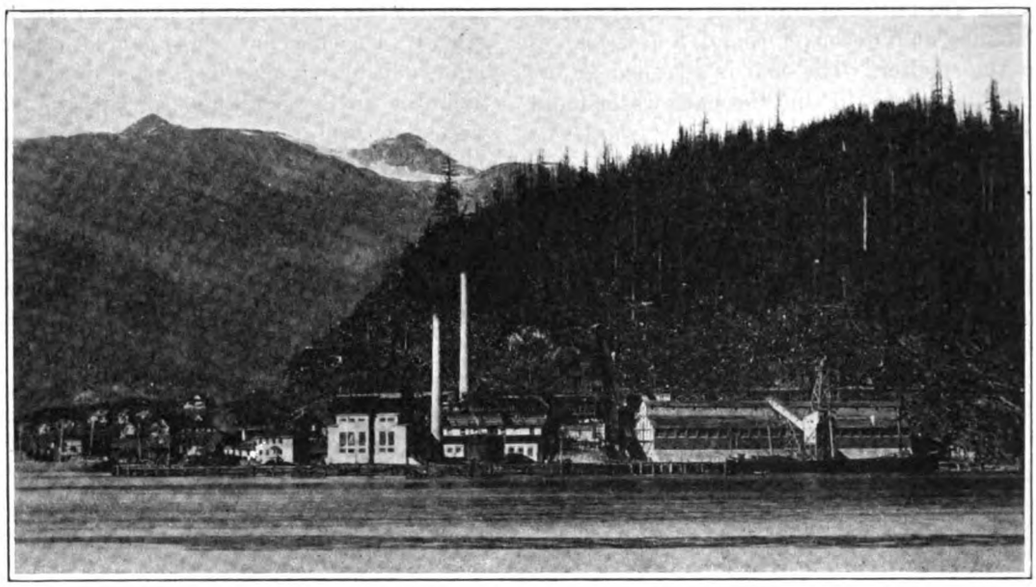
On reaching the by-products building, the gas enters the primary coolers, of which there are three, each containing 594 three-inch outside-diameter lap-welded steel tubes 17 ft. long. The water flows through the tubes and the gas around them. The temperature of the gas is reduced to 32°C. and most of the tar and liquid is deposited. The gas now enters the exhauster, whose function it is to maintain an even pressure in the collecting main and to force the gas through the remaining apparatus. The exhausters, three in number, were built by the Connersville Blower Co., and are driven by 10 by 10 in. vertical self-oiling Troy steam-engines, equipped with Hunton float-governors so as to maintain a pressure of 1 to 2 M.M. in the collecting main.

The exhausters have a displacement of 17 cu. ft. per revolution and are designed to operate at 250 r.p.m. against a total plus and minus pressure of 2½ lb. per square inch.

After leaving the primary coolers, the gas still holds tar in suspension in the form of minute globules called 'tar fog'. The removal of these last traces is accomplished by means of a P. & A. tar-extractor, which consists of a series of perforated steel plates, so arranged that the gas passing through the first plate will impinge upon the unperforated part of the second plate. The impact causes the very fine particles to coalesce and run down the plate.

From the extractors the tar-free gas goes to the saturators, which are lead-lined cast-iron containers, where it is made to pass through a bath containing 5% to 7% sulphuric acid. The ammonia in the gas reacts with the acid to form a white crystalline salt, ammonium sulphate, which settles to the bottom of the saturator and is removed to the drain-table by means of an air-ejector. From the drain-table the salt is conducted to a centrifugal dryer, where it is washed with water to remove the free acid and then dried.

The liquor and the tar which condenses owing to cooling of gases in the various parts of the process are pumped to a separating-tank of 45,000 gal. capacity, where the tar and liquor separate by specific gravity. The liquor overflows into a 50,000-gal. tank and the tar is drawn off from the bottom to a 200,000-gal. tank. The tar is produced at the rate of eight gallons per ton of coal.



THE COKING-PLANT OF THE GRANBY CONSOLIDATED COMPANY, AT ANYOX, B. C.

The liquor, which contains about one-fifth the total ammonia produced, is treated in a continuous still where the ammoniacal vapors are liberated. These vapors are also passed through the saturator, which is so constructed that the waste gases that accompany the ammonia vapor from the still may pass into the main gas-stream, leaving the saturator, or to be conducted into the atmosphere.

The free leg of the ammonia still is made up of three 21-in. cast-iron sections and one 15-in. section, all resting upon the liming-chamber, which is 6 ft. high. The internal diameter of all sections is 4 ft. 3 in. and the total height of the free leg is 15 ft. The fixed leg is made up of two 21-in. sections and one 15-in. section of the same diameter as those comprising the free leg. Each section is provided with a vapor-passage through the bottom, covered with serrated edges, and an internal overflow for liquor passing to the next lower section.

Each section is provided with hand-holes by means of which access can be had to every part of the interior so that the apparatus may be readily inspected and cleaned.

Generated on 2024-09-30 02:08 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

The liquor enters the top of the still and drops from section to section; the steam which enters at the bottom, as well as any liberated vapors, pass through the vapor passages and bubble through the liquor at the edge of the hood. The boiling liquor from which the free ammonia has been expelled, is mixed with milk-of-lime in the liming-chamber and caused to flow into the fixed leg where the remaining ammonia is liberated. The escaping liquor contains 0.033% to 0.007% ammonia.

The saturator is provided with a heater for the mother-liquor; this may be used to maintain the temperature of the bath in case the still is not running or to heat the bath when starting a saturator. Under normal working conditions the heat of the ammonia vapors from the still and the heat of dilution of the sulphuric acid, are sufficient to maintain a temperature of 45 to 50°C. The salt produced averages more than 20 lb. per ton of coal, and contains at least 25% ammonia and less than 0.2 of 1% free acid.

From the saturator the gas passes into the final coolers, which are 40 ft. high and 10 ft. diam., and are of the direct-contact type. The water not only cools the gas but mechanically washes out much of the naphthalene.

To recover the light oils, the gas is scrubbed with straw-oil, a petroleum product, in the hurdle washer 75 ft. high and 14 ft. diam. The slats composing the hurdles are 5 in. wide, ¾ in. thick, and spaced ¾ in. apart; thus the gas in passing through the scrubbers flows in thin streams over surfaces that are continually wet with the absorbent. The travel of the gas and oil is counter-current. The oil is pumped to the top of the scrubber and flows zig-zag down over the hurdles, while the gas enters at the bottom and leaves at the top; thus the partly de-benzolized gas is brought in contact with the fresh wash-oil, which is able more efficiently to remove the small amount of light oil yet remaining and likewise the partly benzolized oil is brought in contact with the rich gas and its light contact-oil increased. The amount of wash-oil circulated depends upon the number of cubic feet of gas produced and its light-oil content, and is of such an amount as to keep the light-oil content of the benzolized wash-oil between 2 and 3%. The benzolized oil is stored in a 3000-gal. tank, from which it is pumped to the stripping-still.

The de-benzolized oil leaves the still at about 130°C., and, before it is re-circulated, its temperature is reduced by a system of heat exchangers and coolers to about 20°C. The de-benzolized wash-oil leaving the bottom of the still and the light-oil vapors leaving the top of the still each contain a considerable amount of heat, which is transferred to the incoming benzolized oil. The benzolized wash-oil is pumped to the vapor-oil heat-exchanger.

From the vapor-oil exchanger, the partly heated benzolized oil joins the oil to oil heat-exchanger, where its temperature is increased by the de-benzolized oil leaving the still. After leaving the oil to oil heat-exchanger, the benzolized wash-oil enters a superheater where its temperature is raised to 140 to 150°C. This superheater furnished by the Alberger Heater Co. of Buffalo, New York, is 8 ft. long and about 20 in. diameter.

The hot benzolized oil now enters a stripping-still which is continuous in its operation. The still is made up of seven sections, each section being 12⅜ in. high and 4 ft. 4 in. diam. The hot oil enters the eight sections from the bottom and passes down the still rapidly, giving up the light oil it contains. Steam is admitted in the bottom section and passes through the still, bubbling under the sealing bells of each tray and carrying upward the light oil in the form of vapor.

As noted before, the de-benzolized oil, on leaving the still, passes through the oil-exchangers, where it gives up some of its heat to the incoming benzolized oil, then to the wash-oil coolers, of which there are two, a tank-cooler containing two ½-in. steel pipes 22 ft. long, and a spray-cooler consisting of sixty 2-in. steel pipes 9 ft. long. From the cooler the oil goes to the de-benzolized-oil tank and is now ready for re-circulation.

From the 23,000-gal. light-oil storage-tank, the light oil is pumped into the crude-oil still, which consists of a horizontal cylindrical kettle holding 3800 gal. and a fractionating column of 14 sections resting on a separate foundation. Heat is supplied by means of indirect steam through sixteen 1½-in. extra-heavy pipes 13 ft. 10 in. long, placed in the bottom of the kettle so that the direct steam may be used when desired. The presence of live steam lowers the boiling-point and is necessary when the toluol and solvent fractions are reached.

The operation of the raw-oil still depends upon whether motor-fuel or pure products are to be produced. The first portion to distill is often discarded because of the carbon bisulphide it contains. When making pure products the crude distillate is divided into 90 benzol, 90 toluol, and solvent naphtha.

These crude products are then transferred to a lead-lined agitator where they are washed with sulphuric acid for about thirty minutes, after which about another thirty minutes is allowed for the used acid to settle. The acid is used to separate the unsaturated hydro-carbons, principally olefines. After the sludge is run off the benzol or toluol is washed with water and any acid remaining neutralized with caustic soda.

The washed products are now ready for rectification in the pure-oil still. This is similar to the crude-oil still in construction but greater care and skill is required in its operation. Each 1000 gal. of light oil will produce about 500 gal. C.P. benzol, 100 gal. C.P. toluol, and 100 gal. refined solvent naphtha. When making motor-fuel, the benzol, toluol, and such higher portions as will give a finished product that will distill to complete dryness at not over 135°C. are caught in the same receiver. After the crude motor-fuel has been run off, there still remains a solvent naphtha fraction, boiling at from 130° to 170°C. The crude motor-fuel is also washed with sulphuric acid, but not so thoroughly as in the case of pure products. This washed motor-fuel is then run through the pure-oil still in order to remove the last traces of water and any foreign substances that do not settle after washing. The products made are coke, gas, tar, ammonium sulphate, benzol, toluol, solvent naphtha, and naphthalene.

Generated on 2024-09-30 02:12 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

The Development of a California-Made Specialty Machine

THERE are three concerns in the United States manufacturing fare-boxes for pay-as-you-enter street-cars. Two of these are in the Middle West, commonly supposed to be the home of quantity production and low labor and material costs. Yet, when soon after the Armistice, the Brooklyn Rapid Transit Co. invited competition for supplying it with fare-boxes, the contract went to the third concern, the American Coin Register Co., of Emeryville. Some of the reasons for this are given in the accompanying article.

The average street-car or theatre patron, who drops his money into the pay-as-you-enter machine and hurries on, probably does not bestow even a first thought upon the time and labor saving machine he has just passed. Yet this machine comprises a number of interesting mechanical devices, and its development has required a large expenditure of time, study, and money.

Although there are two other concerns manufacturing fare-boxes, both of them in the Middle West, the chances are the machine that was taken as a matter of course by our passenger or theatre-goer was made by the American Coin Register Co., of Emeryville, California. This company was organized in 1914 by C. C. Voglesong, who designed both the coin-registering and the coin-changing machines made by the company, and who has acted as president and general manager since the time of incorporation. Like almost all new concerns, the Coin Register company passed through some lean years during the period of the introduction of its product, its problem being particularly difficult because three parties, the buyer, the operator, and the public, had to be convinced of the convenience and practicability of the machines. The buyer of the machines, in most cases, had first to be 'sold' the idea of buying a machine at all before it became possible to sell him one of the company's machines.

However, the company made a good machine and one for which there was a real and definite need, so that by degrees the sales of the machine increased and the chances of a visit from the sheriff approached the vanishing point. The first large order came in 1915 from the Panama-Pacific International Exposition, which equipped all gates with coin-changers, handling coins and making change up to and including $20. About the same time, the gates at the waiting-room of the Southern Pacific Co. at the Ferry building at San Francisco were equipped with power-driven machines, which handle both money and tickets, cancelling the tickets, and registering and segregating the different denominations of coins. The change-making device on the machines makes change up to and including $5, the same absolute accuracy being obtained whether the coins are new or badly worn. After five years of service, during which time each one has registered millions of fares, the original machines are still in use, the only parts requiring renewal being the bushings on the drive-shafts. From time to time, additional machines, five in all, have been purchased to handle the increasing ferry-traffic.

During the same year, the first order for street-car service, 20 fare-boxes for the Oakland Traction Co., was received. These machines are still in service. In 1916, the model A power-driven admissions-receipts machine was developed and a large number of them are in use at moving-picture theatres and also at Neptune Beach, Alameda, and the Exposition Auditorium, San Francisco.

During the War, the production of all these machines was practically suspended, and the entire resources of the factory devoted to war work, principally aeroplane parts, including practically all the fuselage fittings used by the different contractors on the Pacific Coast, and parts of various kinds for the Hall-Scott Motor Car Co. and for the hydroplane motors made by the Union Gas Engine Company.

Soon after the armistice, the Brooklyn Rapid Transit Co., of New York, asked for bids for equipping its cars with fare-boxes. Although the two Middle Western companies already mentioned might easily be supposed to have had the advantage on such an order the contract was awarded to the Coin Register company. Up to the present time, 600 machines have been delivered to the Brooklyn company and further orders are on hand.

In the accompanying illustrations, Fig. 2 and 4 show some of the more important parts common to all the machines. Fig. 2 shows the coin-receiver and coin-segregating plate, inverted for convenience in showing the mechanism. The coin is dropped into the receiver and passes a coin-deflector situated within the box. One of these deflectors is shown in Fig. 8 at the extreme right. This deflector is mounted on a shaft on the other end of which is another deflector, which projects below the box as shown in Fig. 1 and 7. This double-ended arrangement acts as a sort of 'check-valve' to prevent tampering with the contents of the box, or the removal of coins before they have been duly recorded. The coins remain in sight so that the operator can satisfy himself that the amount paid is correct, when he turns the crank dropping the coins through the segregating-plate, shown mounted on the left of Fig. 2 and separately on the right. Turning the crank causes the geared wheel shown in Fig. 8 to re-

Generated on 2024-09-30 02:08 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

FIG. 1

FIG. 2

FIG. 3

FIG. 4

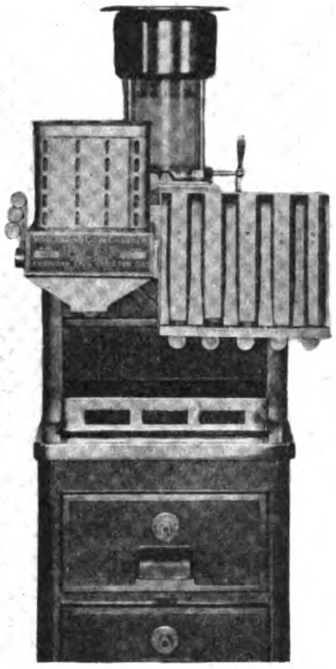


FIG. 5

FIG. 6

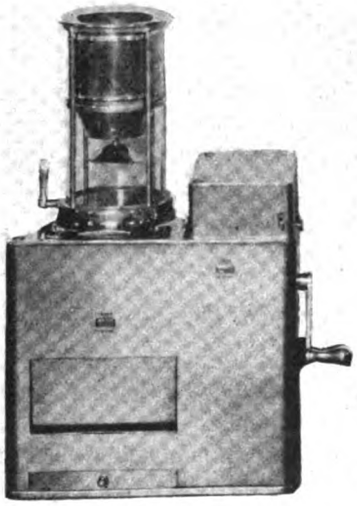


FIG. 7

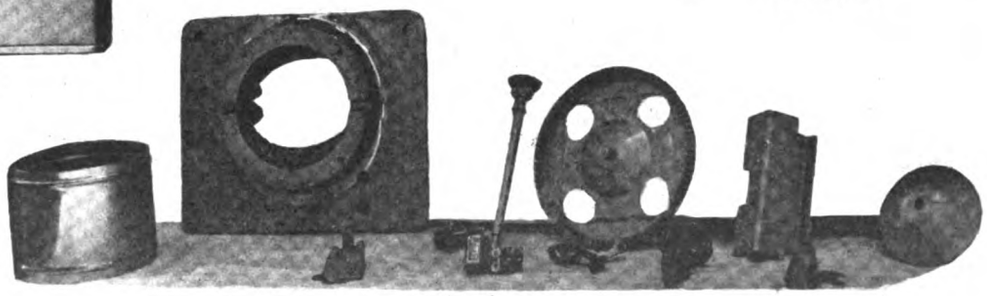


FIG. 8

COIN-REGISTER MACHINES AND PARTS. FOR DESCRIPTION SEE TEXT

Generated on 2024-09-30 02:10 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from
UNIVERSITY OF ILLINOIS AT
URBANA-CHAMPAIGN

volve, and allows the coins to drop through the wheel and plate, properly segregated into the coin-chutes below, each kind of coin going into a separate chute. Two of these coin-chutes are shown in the foreground in Fig. 8. One-cent pieces go to a separate counter, resembling an old-style bicycle cyclometer and shown in the foreground of Fig. 8. The other coins go to the coin-carrier and register as shown in Fig. 4. Each kind of coin has been deflected by its particular coin-chute to the proper division of the carrier. The register counts in multiples of five cents. A nickel increases the reading by one, a dime by two, a quarter by five, etc. The register in Fig. 4 indicates that 99,925 times five cents has passed through the machine. Fig. 4 also shows the tapering part forming the lower end of the coin-receiver. In Fig. 8 are shown several other parts, including the base to which the segregating plate is attached, a bevel-pinion and gear, a pinion-shaft, and a wheel-bracket.

Fig. 7 shows a street-car combination pay-as-you-enter and transfer-printing and issuing machine. Fig. 3 is an old-style pay-as-you-enter theatre-machine. Fig. 1 is the regular model E, pay-as-you-enter street-car machine. Fig. 6 is an old-style pay-as-you-enter street-car machine. Fig. 5 is the power-driven theatre machine already mentioned in this article. Besides recording the coins dropped in the receiver in the manner already described, this machine is equipped with a coin-changer and a holder for reserved-seat disks.

The manufacture of these machines requires many dies and jigs, $55,000 having been spent on dies alone, a large expenditure, but one fully justified by the economies obtained on quantity production, as well as by the fact that unskilled and semi-skilled labor can be used for most operations. Only about 10% of the work is done by skilled mechanics.

The expansion of the company's business has made necessary the erection of a reinforced-concrete building to accommodate several departments. When this is completed, several additional lines will be manufactured, including a four-speed axle for Ford automobiles, the Miller clothes-dryer, the Weissel automobile-lock, which is to be made for the Walker Automobile Specialty Co., and the Norton radiator-cap, for the Williams Hinge Cap Co., of Salt Lake City. The officers of the company are: C. C. Voglesong, president; James Lynch, vice-president; T. S. Elston, secretary and treasurer; J. W. Glover, general manager; W. S. Wells, Jr., general counsel; and Lester Hink, Frederick Fink, C. O. Whitmore, and M. W. Dobrzenski, directors.

CHARCOAL should be used as a covering when melting copper, brass, bronze, and similar metals, except aluminum. It supplies a reducing atmosphere when burning and thus prevents the oxidation of the molten metal. At the same time it covers the metals and prevents the products of combustion from coming in contact with it. Its freedom from sulphur renders it the ideal material for this purpose.—E. S. Sperry, in 'Brass World'.

Automobile and Railroad Associations Against Compulsory Metric Legislation

At a convention of the American Railway Engineering Association held in Chicago, March 15 to 19, the question of the adoption of the metric system in this country was considered. W. C. Wilson, representing the American Institute of Weights and Measures, made a presentation of the position of the Institute as opposed to compulsory metric legislation. There was a small faction present that sought to side-step the issue but on a standing vote this was overwhelmingly defeated and the following resolution adopted with applause:

"The American Railway Engineering Association, in convention assembled, expresses its opposition to the adoption of the metric system of weights and measures to the exclusion of the English or the American system at present in general use."

At a meeting of the Executive Board of the National Automobile Chamber of Commerce, held on March 3, the following resolution was adopted:

"Whereas, efforts are being made to require by Congressional legislation the use of the metric system of weights and measures in this country, and

"Whereas, a canvass of motor-car manufacturers, members of this organization, has failed to develop that any of them are in favor of such legislation, owing particularly to the difficulty at this time of changing dies, factory equipment and mechanism and the great cost of same; also the confusion that would be created among workmen who have not been educated in the metric system, be it

"Resolved, that this Board is opposed to legislation making the use of the metric system of weights and measures obligatory, and recommends that members of the National Automobile Chamber of Commerce lend their support to the American Institute of Weights and Measures, which is actively opposing this movement."

Heat Treatment of Steel Castings

In an article appearing in the 'Journal' of the American Steel Treaters Society, A. N. Conarroe discusses the heat treatment of steel castings. He states that the coarse-grained structure commonly known as 'ingotism' is best remedied by heating considerably above the critical range, allowing to cool, and then re-heating to a lower temperature, holding the material long enough at these temperatures to ensure the penetration of the heat to the centre. The material should then be allowed to cool to atmospheric temperature, either in the furnace or in the air, depending upon the properties desired in the product. The 'dendrite' form of structure, on the other hand, requires heat above the critical range, quenching to prevent the re-deposition of the phosphoric segregates, followed by a heating to a lower temperature within the critical range further to refine the grain-structure. Sonims usually need a double heat treatment.

Generated on 2024-09-30 02:08 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

The Industrial Court of Kansas*

By HENRY J. ALLEN†

The law creating the Industrial Court in the State of Kansas is not even a distant relative of the process of arbitration or conciliation. The Industrial Court is not a court of arbitration. It is a court of justice and it has in its personnel no representative either of capital or of labor in the ordinary sense. The Court represents the public in the function of government. It is the first step in the evolution away from our difficulties of industrial warfare, and it comes to meet a similar need to those causing the formation of the criminal court and the civil court.

The Industrial Court of Kansas is not a court of arbitration. It is a court of justice.

There was an hour when there was no better way, apparently, for giving sanctification to property right than the right of might. Men who took what they could take and kept what they got had title. Then society came along with the idea that there must be a readjustment of that situation and we established the civil courts. Surely no man would today go back to the old process. Now we have come to the understanding that society has the same right to take jurisdiction over offenses committed against it in the name of industrial warfare as it had to take jurisdiction over recognized crime.

Society has the same right to take jurisdiction over offenses committed against it in the name of industrial warfare as it had to take jurisdiction over recognized crime.

In Kansas we have created a Court which merely applies a new set of rules to an old principle. Those of you who are lawyers know that in the thirteenth century a blacksmith's shop along a public highway in England was a public utility, because the travel was by horseback and stagecoach and they had to have a sure provision for the re-shoeing of horses.

Now, every organized country has accepted that principle and each State and the National government, as well, have declared that transportation, because it is so impressed with the public interest, is subject to regulation by Government. Kansas has added to transportation the other essential industries, of food, fuel, and clothing, and says that because they are impressed with the public interest they should therefore be regulated by the public.

We have established a Court of three members, appointed by the Governor, with overlapping terms—men selected without any restriction as to their profession, age, or partisan affiliation, men selected because this is a Court of justice, and likewise, a Court of human relations. The Court has the power, first, to investigate labor conditions. We are now, in the mining district with two members of the Court, trying to determine a proper relation between the cost of living and the cost of mining, and then the Court has the power, either upon its own initiative or upon petition by either side of a controversy or upon the initiative of the Attorney General or upon the initiative of any ten citizens of the State, to bring into Court any men from either side of this industry and issue orders touching working conditions or wages; it has the power to fix a maximum wage-scale pending the settlement of a controversy, and the settlement of a controversy as determined by the Court is a final settlement with a Court order and all the dignity behind it of impartial just government.

The settlement of a controversy as determined by the Court is a final settlement with all the dignity of Government behind it.

We do not take from any man his right to quit work. Government should not do that if it could, and so we do not seek to do that. We recognize collective bargaining and legalize it and believe that the condition of industrial peace founded upon mutual understanding, mutual interest, and mutual confidence is the finest basis of industrial peace, but when negotiation has failed, then the Court steps in and offers itself as a substitute for the strike, the lock-out, the picket, the black-list, and the boycott. We do not say that any man shall not quit work but we do say that if any man conspire with any other man to reduce production in an essential industry, then that man has committed a misdemeanor or a felony, into whichever class it falls, and shall be prosecuted in the criminal courts of the State.

The law establishing the Industrial Court does not take from any man his right to quit work.

We have provided that industry should be carried on with reasonable continuity and that operations should not cease for the purpose of affecting a wage controversy or the price of the commodity. This is already having a fine effect down in our district. We have found that, heretofore, the miners down in the Kansas field have worked on an average 211 days a year. Part of the time they were idle because they were striking, and part of the time they were idle because the coal mines were waiting for a livelier market for their coal.

The new law provides that the coal mines shall continue to operate. Heretofore they have been operated about one day a week during the summer. Hereafter they will operate during the summer and we in Kansas are going to begin the winter with a coal reserve instead of a coal famine and the miners are going to have work during the summer.

*Excerpts from an address given before the First Annual Meeting of the National Federation of Construction Industries, Chicago, Illinois.

†Governor of Kansas.

Generated on 2024-09-30 02:07 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

We also provide that if men are not members of this essential industry and therefore are not under its jurisdiction, the Court may offer itself as mediator, with the common agreement of both parties, to all the other industries. We have seven or eight controversies that have come voluntarily into the Court by the agreement of both sides, and this we have done to the atmosphere of Kansas: We have created the expectation on the part of the public that there are to be no more strikes and that has been of great benefit.

As I say when the labor leaders tell us that we have taken away their right to strike, I have been examining into the use which they made of that weapon in Kansas during the months that preceded the strike. I found that in the thirty-three months ended on January 1, 1919, they had had 394 separate and distinct strikes in the mining district, an average of eleven strikes a month. The victory gained for the miners in these 394 strikes amounted in dollars and cents to $787.94; it cost them in wages $1,806,000. That was the record up to 1919. In 1919 the record is even more ghastly because of the general strike. In Kansas alone it cost the miners $1,900,000 in wages to strike. They gained no benefit, and out of their own pockets, in addition to the wages lost, they paid for the maintenance of their radical and characterless leaders $157,000. Surely, Government may do better for poor people than that!

That is all we have done. We have gotten away from arbitration because arbitration has never succeeded. When you, representing your side, select a man and I, representing my grievance, select a man and the two select a third man, who is the umpire?

He can do one of three things. He may join your side and get a partisan decision, he may join my side and get a partisan decision, or he may dicker back and forth and get a compromise; and into the consideration of that form of arbitration there never comes any consideration of the public welfare.

Statistical Study as a Means of Accident Prevention

Statistics, says Royal Meeker, United States Commissioner of labor statistics, in the 'National Safety News', are commonly considered to be dry and rather useless arrays of figures. No popular idea is more at variance with the truth than this misconception of the nature and purpose of statistics. In the field of accident prevention, safety men were unable to make much impression on the frequency of accident occurrence until accident statistics showed the causes responsible for the accidents.

The crude statistics of accident occurrence, which counted all accidents as equally important, whether causing death, the loss of an arm, or a cut on the finger, were useful in assisting the safety men to determine the causes and reduce the number of accidents, but they were inadequate for attacking the causes of the fatal and more severe accidents. The analyses by the U. S. Bureau of Labor Statistics of accidents by length of disability or severity of injury had important results. Some industries and occupations with high accident-frequency rates had low severity-rates. On the other hand, many industries and occupations with low frequency-rates had high severity-rates. It was further discovered that the fatal and more severe accidents were mainly caused by faulty lay-out of plants and faulty construction of equipment. For instance, blast-furnaces formerly contributed largely to the fatal accidents in the manufacture of iron and steel. The heavy toll of deaths from blast-furnace accidents led to improvements in construction by which 'blow-outs' with their accompanying fatalities have been almost entirely eliminated. The substitution of mechanical charging for the old hand-charging method has practically eliminated the former fatal 'gassing' accidents among the men obliged to work on top of the old type of blast-furnaces. These improvements in the construction of blast-furnaces were the analyses of accident statistics and the calling of the attention of those responsible for the direction of industry to the causes of the more severe accidents.

It is impossible to differentiate accurately responsibility for accident occurrence. There must be the fullest co-operation between management and men if accidents are to be reduced to the irreducible minimum. Workers must be educated to be careful in doing their work. The management must be educated to be careful in laying out and building the plant and equipment to be used by the workers. The analyses of accident statistics made by the U. S. Bureau of Labor Statistics indicate that the education of the workman may and does result in reducing greatly the number of accidents, especially the minor ones. These studies indicate with equal precision that we must depend upon the education of employers to bring about any marked decrease in the severity of accidents. Workers can spend all their time being careful in a badly constructed or badly equipped plant and yet be killed or seriously injured by reason of unsafe railroad yards or badly designed or badly built machines and other equipment.

The safety movement has gained tremendous impetus. The workers are being educated in the gospel of being careful not merely for their own safety but for the safety of their fellow-workers. Employers are also being educated to provide safe and sane workshops and equipment for their workers to use. The great need of the hour is more accurate accident statistics and more intelligent tabulation and analysis of such statistics. Employers have gone about as far as they can go in directing the safety campaign until they can be given more information about the causes and severity of accidents in industries and occupations that have not yet been included in detailed accident studies.

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

The most important contribution that could be made to the further development of the safety movement would be the adoption in all the States of uniform accident-reporting blanks. These blanks should call for the essential facts that safety men and factory inspectors must know to determine the causes and results of accidents. These uniform accident reports should be tabulated on the forms adopted and according to the rules laid down by the Committee on Statistics and Compensation Insurance Cost of the international Association of Industrial Accident Boards and Commissions. Information regarding accident occurrence and results collected in a uniform way from all industries and plants throughout the country and tabulated in a uniform manner would be most valuable to employers, employees, and factory-inspection departments. The safety movement could then be directed intelligently toward the reduction or elimination of the more severe accidents in the industries and occupations with the higher severity rates.

The campaign for the reduction of severe accidents need not at all diminish the vigor of the campaign for the reduction of minor injuries. It is important to reduce the occurrence of all accidents, minor and major, to the minimum, but the point that needs emphasis just now is the fact that it is more important to prevent the loss of the legs, the arms, and the lives of workers than to prevent the loss of the finger-nails and skin of workers.

The men engaged in analyzing accident statistics by tabulating them as to causes and severity of injuries are like the general staff of the army. They map out the objectives of the campaign and furnish the information necessary to attain these objectives most speedily and economically. The 'safety-movement army' has now caught up with the general staff. It has attained all the objectives that have been mapped by the statistical strategists. The imperative need of the army now is for better and more detailed maps of the enemy's country and the clear indication of the objectives for the next onward movement. These maps can be supplied only by the statisticians when they obtain more complete and accurate accident statistics. Let the watchword be the prevention of every preventable accident. To attain this goal, accurate, complete, and comprehensible accident statistics are indispensable. Better statistics make for better safety work.

Two recent income-tax rulings by the Internal Revenue Department are hereby suggested for classification among the things about which we should worry. One holds that "Unavoidable absence of a wife, due to the 'World War', will not preclude a husband from claiming the joint personal exemption of $2000", and the other that "Debts due by one belligerent State to the citizens of another State are not extinguishable by war. Consequently, a taxpayer having an outstanding claim against the German government, dating before the War, would not be justified in charging the amount of the claim as a loss".

Is This a Nut for Our Bolt?

An Eastern manufacturer of machinery says:

"Do not deceive yourselves into thinking that you are going to run your machine tools with machinists. That is a thing of the past. The machinist that you knew about your works who was a truly trained machinist is now an inspector, a foreman, a designer, or the owner of a part or all of a small shop. There is no one to take his place. He is gone and you must meet the condition with the educated mechanic and the common laborer working on the highly developed production tool or the automatic."

The 'educated mechanic' in the case mentioned above refers to the technically trained man, or the man that is educated in your own shop, where a part of his time is devoted to study and part to mechanical work. This man must direct the many hands that operate the special or manufacturing equipment and he must in addition set up the tools for the laborer who is to get out the work to handle.

In the Bay district all shops are leaning to the manufacturing equipment, production tools, tools that require the least possible knowledge of mechanics, and this is for the reason that there are no men with the necessary training to handle the tools as did the real machinist. The demand today is for the semi-automatic and the automatic, the plain manufacturing machine of moderate cost that can stand idle part of the time without the heavy overhead of the universal machines, which require the skilled machinist, and particularly for the automatic that can be set up by the educated mechanic and operated by a laborer or, if light work, by a woman. The large manufacturers of machine-tools are all endeavoring to produce the labor-eliminating tool, not eliminating the manual labor so much as the skilled labor, which has become so scarce and so expensive. Neither is the situation likely to improve in the near future.

American Machine-Tools in the Dutch East Indies

According to Harry Campbell, U. S. Consul at Soerabaya, Java, American machine-tools are rapidly gaining an enviable reputation in the Dutch East Indies. One of the largest and most successful machine-shops in Soerabaya is completely equipped with modern American machine-tools and is securing an abundance of orders for shopwork which, apparently, it is able to fill more satisfactorily than any of its competitors. This concern has recently been awarded the contract for the iron and steel work of a new Government railway terminal at Tandjong Priok, the port of Batavia. This speaks well for the Soerabaya shop, with its American equipment, in view of the competition of Batavia firms situated so much nearer the work and which might be expected to be in a better position to handle it.

Generated on 2024-09-30 02:07 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Gears: The Cycloid Tooth—III

By EDWARD LESLIE

"There is no more need of two different kinds of tooth-curves for gears of the same pitch than there is need of two different kinds of threads for standard screws, or two different kinds of coins of the same value, and the cycloidal tooth would never be missed if it were dropped altogether. But it was first in the field, is simple in theory, is easily drawn, has the recommendation of many well-meaning teachers, and holds its position by means of 'human inertia', or natural reluctance of the average human mind to adopt a change, particularly a change for the better."— Grant's 'Gearing'.

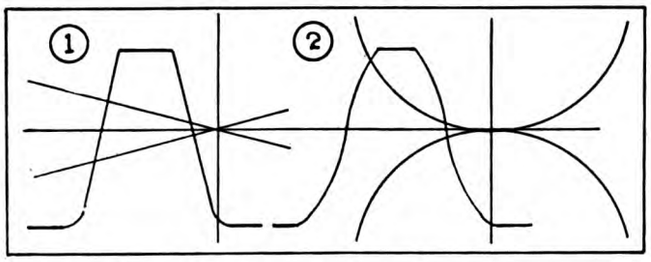


FIG. 1 AND 2. INVOLUTE AND CYCLOIDAL TEETH

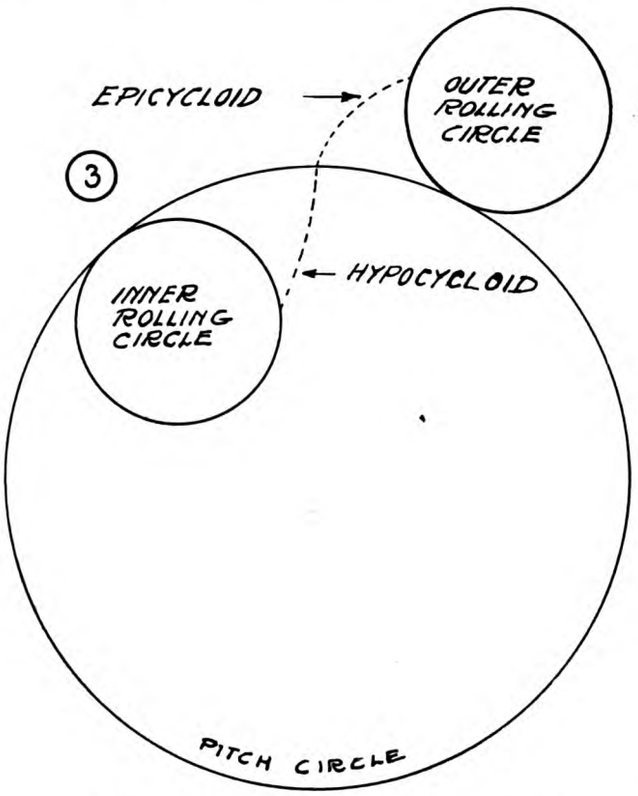


FIG. 3. CURVES USED IN CYCLOIDAL SYSTEM

If the rack odontoids are straight lines (Fig. 1), the line of action will be a straight line, at right angles with the rack-tooth, and will produce the involute-tooth system. If the rack odontoids are cycloids (Fig. 2), the line of action will be a circle equal to the roller of the cycloid, from which is obtained the cycloidal system of gearing. A cycloid is a curve traced by a point on the radius of a circle, rolling in a plane along a line in the plane.

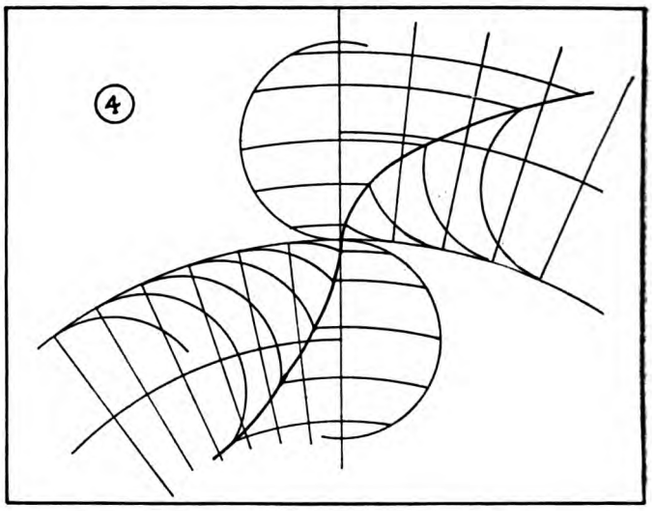


FIG. 4. EPICYCLOID AND HYPOCYCLOID CURVES

Fig. 3 shows the outer and inner rolling circles, rolling on a pitch-circle, and the result. If the circle is rolled on the outside of a fixed circle, the curve traced would be an epicycloid. Should the circle be rolled on the inside of a fixed circle, the curve traced would be called a hypocycloid. These are the curves used in the cycloidal system.

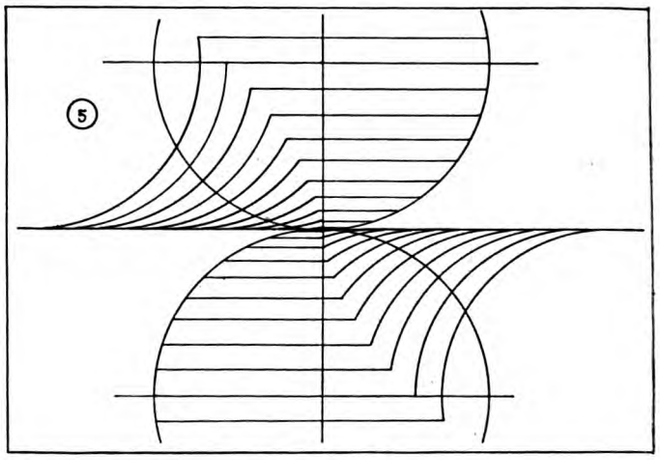


FIG. 5. CYCLOIDAL RACK-TOOTH CURVE

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Fig. 4 shows in detail the graphical explanation of the epicycloid and hypocycloid curves, and is sometimes termed the rolled-curve method. Fig. 5 shows the detail of the cycloidal rack-tooth curve. The standard tooth for the cycloidal system is, by common consent, one having a roller circle (or line of action) half the diameter of a gear having 12 teeth, so that the gear has radial flanks. The standard cycloidal-gear cutters have radial flanks for a gear of 15 teeth. It would be better to have them run to 10 teeth, so that smaller gears would not have under-cut flanks. The rule laid down by some teachers is that the diameter of the rolling circle is one-fourth of the pitch-diameter of the smallest gear in the set. For example: In a set of three gears that run together and having pitch diameters of 10 in., 20 in., and 30 in. respectively, the diameter of the rolling circle for the set is one-fourth of 10 in. or $2\frac{1}{2}$ inches.

In order to understand thoroughly the evolution of

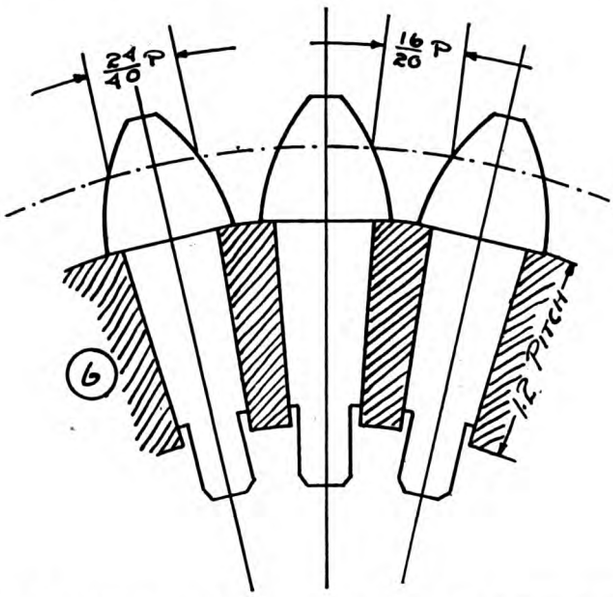
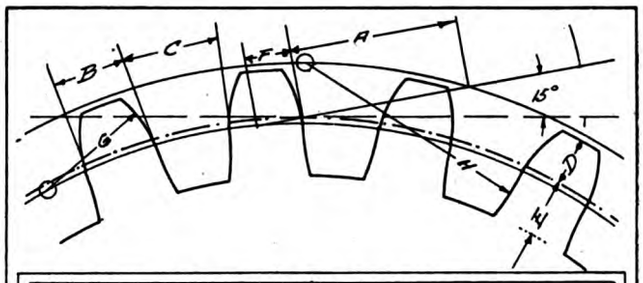


FIG. 6. METHOD OF INSERTING WOODEN TEETH INTO CAST-IRON BLANKS

gearing up to the present time, the cycloidal system must be considered, because of the many thousands of dollars represented in patterns still stored away, and which must be used in break-down repairs, where cycloidal sets are in storage. The chart and accompanying tables show one of several standard methods of laying out the cycloidal-tooth curves, and are self-explanatory.

When the cycloidal system of gearing was in vogue, before the time when the state of mechanical arts had advanced to the point where gear teeth were cut in a machine, all gears were cast, with the exception of gears made by the old-time millwright by inserting wooden teeth into cast-iron blanks as shown in Fig. 6. Much might be written regarding the crude, though practical, qualities of the wooden gear-wheel.

The cycloidal proportions and dimensions originated at the time have been handed down to the present time with but little change, regardless of the fact that by the



A	SEE TABLE-A-	E	.39 OF PITCH
B	5/11 OF PITCH	F	SEE TABLE-F-
C	6/11 OF PITCH	G	F+B
D	.31 OF PITCH	H	A+C

ELEMENTS OF 15° CYCLOIDAL TOOTH

TABLE -A-

No. of Teeth	PITCH 1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3
13	1.60	2.40	3.20	4.00	4.80	6.45	8.00	9.65	11.25	12.8	14.45	16.05	19.3
14	.85	1.30	1.75	2.15	2.60	3.45	4.35	4.70	6.05	6.95	7.80	8.65	10.4
15	.60	.90	1.25	1.55	1.85	2.45	3.10	3.70	4.30	4.95	5.55	6.15	7.55
16	.50	.75	1.00	1.25	1.50	2.00	2.50	2.95	3.45	3.95	4.45	4.95	7.40
17	.40	.65	.85	1.05	1.25	1.70	2.10	2.50	2.95	3.35	3.75	4.20	5.05
18	.35	.55	.75	.95	1.10	1.50	1.85	2.25	2.60	2.95	3.35	3.70	4.45
19	.35	.50	.65	.85	1.00	1.50	1.85	2.25	2.60	2.95	3.35	3.70	4.45
20	.30	.45	.60	.80	.95	1.25	1.55	1.85	2.15	2.45	2.80	3.10	3.70
22	.25	.40	.55	.70	.80	1.10	1.35	1.65	1.95	2.15	2.45	2.70	3.25
24	.25	.35	.50	.60	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.45	2.95
26	.25	.35	.45	.55	.70	.90	1.15	1.35	1.60	1.85	2.05	2.30	2.75
28	.20	.30	.45	.55	.65	.90	1.15	1.35	1.60	1.85	2.05	2.30	2.75
30	.20	.30	.40	.50	.60	.85	1.05	1.25	1.45	1.65	1.85	2.05	2.45
35	.20	.30	.40	.45	.55	.85	1.05	1.25	1.45	1.65	1.85	2.05	2.45
40	.20	.25	.35	.45	.55	.75	.90	1.05	1.25	1.40	1.60	1.75	2.10
60	.15	.25	.30	.40	.45	.65	.75	.95	1.10	1.25	1.40	1.55	1.85
80	.15	.20	.30	.35	.45	.60	.75	.85	1.00	1.15	1.30	1.45	1.75
100	.15	.20	.30	.35	.40	.55	.70	.85	1.00	1.10	1.25	1.40	1.70
150	.15	.20	.25	.35	.40	.55	.65	.80	.95	1.05	1.20	1.35	1.60
RACK	.15	.20	.25	.30	.35	.50	.60	.75	.85	1.00	1.10	1.25	1.50

TABLE F

No. of Teeth	PITCH 1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3
12	.05	.10	.10	.15	.20	.25	.30	.35	.45	.50	.55	.60	.75
15	.05	.10	.15	.15	.20	.25	.35	.40	.50	.55	.60	.70	.85
20	.10	.10	.20	.20	.25	.30	.40	.45	.55	.60	.70	.75	.90
30	.10	.15	.20	.20	.25	.35	.45	.50	.60	.70	.80	.90	1.05
40	.10	.15	.20	.20	.30	.40	.45	.55	.65	.75	.85	.95	1.15
60	.10	.15	.20	.25	.30	.40	.50	.60	.70	.80	.90	1.00	1.25
80	.10	.15	.20	.25	.30	.45	.55	.65	.75	.85	.95	1.05	1.30
100	.10	.15	.20	.25	.35	.45	.55	.65	.75	.90	1.00	1.10	1.30
150	.10	.15	.25	.30	.35	.45	.55	.70	.80	.95	1.05	1.15	1.35
RACK	.10	.20	.25	.30	.35	.50	.60	.75	.85	1.00	1.10	1.25	1.50

Generated on 2024-09-30 02:10 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

dropping of this form of tooth, conditions were entirely changed. The use of the involute form of tooth, together with the diametral-pitch system of measurement, has grown gradually but steadily, and it now supersedes all other forms. With the cycloidal system, the angle of obliquity is 15°, and in determining the proportions for the interchangeable involute gearing, this angle of rack was adopted as the basis of the system. In other words, the 14½° angle of obliquity, or pressure-angle, was taken from the old system of cycloidal gearing, and so strongly has the 14½° involute form been impressed upon the minds of those in the industry that it has been assumed that a greater angle of obliquity cannot be used with success. The comparison between the 14½° and the 20°, or newer, tooth-form will be fully discussed in a later article.

Steel for High-Grade Bearings Produced From Scrap

The steel manufactured by the Timken Roller Bearing Co. is made from scrap especially selected as to its physical character and chemical analysis, says E. G. Stedman, superintendent of the electric furnaces of the company in 'Raw Material'. After having been inspected it is unloaded by magnet in the electric-furnace building, and is brought to the furnaces as required after being reloaded in scrap-skips—the contents of two of these skips being sufficient for an entire heat. These skips are first weighed and placed opposite the charging-doors of the Heroult furnaces before the previous heat is tapped. This facilitates the charging operation, which begins immediately after the heat has been tapped and the bottom repaired.

All charging is done by hand and approximately thirty minutes is required for the entire charge. Scrap is used in proportions of 20% heavy melting-steel and 80% turnings. Power is then applied at the rate of 500 kw. per phase for approximately 2½ hours, when the bath is completely melted. At intervals, however, during this melting-period, the scrap must be broken loose and pushed away from the banks toward the centre of the furnaces, in order to reduce the length of the melting-period, as the greatest heat is obtained in the immediate vicinity of the electrodes, which are in the centre of the furnaces. After the scrap is melted, the power is reduced to approximately 200 kw. per phase, until the first or dephosphorizing slag is removed.

Poland Seeks American Farm-Machinery

All Poland is clamoring for American farm-implements—in vain. Although Polish farmers are inclined to seek American goods and the Government officials are citing American methods as the standard, American Red Cross workers in that country see peasants using wooden plows. Primitive implements of Russian make are the rule, and of hand-tools the farmer seldom owns more than a heavy spade and a cumbrous hoe.

Why have American manufacturers not gone into this virgin field which beckons to the implement-man from the United States? Credits—there lies the reason. The United States and Poland have not yet straightened out this tangled difficulty which bars Poland from amelioration of her agricultural condition unless help comes to her from other countries than the United States.

Polish farms, the chief source of the nation's living, are commonly flat as checker-boards and almost as free from stones. The soil is easily worked. There is no implement known to the modern agriculturist, from the huge machines capable of doing the work of twenty men to the wheel-hoe of our small gardeners, that could not be profitably used in Poland. Her farmers also need axes, saws, chisels, hammers and other hardware.

The disposition of the Polish farmer to seek American products has prompted the Government officials to consult Red Cross representatives about the best way to educate the people in American methods. France and England have their eyes on this market, and Austria and Germany already have made tentative advances. An excellent opportunity will be lost if American dealers fail to avail themselves of the Polish farmer's preference for their goods.

War Saving Stamps Decrease Labor Turnover

Regular savings and safe investments on the part of employees, which naturally have a definite cash value to the workers themselves, also have a definite cash value to the establishments by which those workers are employed. Conclusive proof to that effect is furnished by a recent letter from H. S. Taylor, secretary of the War Savings Society of the New York Shipbuilding Corporation at Camden, New Jersey, to the Savings Division of the Treasury Department. In one department alone, he declares the habit of saving and investment in Government savings securities has meant the difference between a complete labor turnover every two weeks and a stable steady force with a minimum of change. Mr. Taylor writes:

"In our lumber shop the labor turnover was almost 100% every two weeks. After a while, the War Savings Secretary for that department succeeded in persuading all the men in his shop to become savers. As a result of his efforts for months there has been almost no change in the working force of his shop."

Of the relation of savings to efficiency, Mr. Taylor says:

"It often happens that the strongest and best departments in the yard are composed of the best savers. An example is our joiner shop. In the plate-and-angle shop, a department of five hundred men containing many foreigners, a canvass was made to find out which men desired to take out citizenship papers. All those who wished to take out first papers were saving money by buying War Savings Stamps, while not a man who had refused to take out first papers was doing so."

Generated on 2024-09-30 02:08 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Do We Want Industrial Peace?*

By GEORGE C. MASON†

As employers, we have to consider two groups of people, our employees and the public. In our dealings with our employees, the sooner we realize we can no longer assume the attitude that 'this is my business and I am going to run it to suit myself', the better it will be for us. It is not my business alone, and those of us who have come to realize that fact have learned that by getting in close touch with our employees we not only make better men of them, but we make better men of ourselves. We can learn from them as much as we can teach them, and by coming in close contact with them we establish a relationship that cannot be bought.

I sat as one member of a board of five, two of which were appointed by the American Federation of Labor. They assumed that the other three were opposed to them and they showed it plainly in their talk and in their actions. This board sat for one week, meeting mornings, afternoons, and evenings, and we turned in a unanimous report, which was accomplished only by our getting acquainted.

To bring this right home to you, I suggest that you adopt what is known as the 'shop-committee plan'. I do not care how the scheme is elaborated. I do not care anything about the details of your plan, but in some way adopt the idea of getting together with elected members of a committee of your employees and thereby establish a means of communication that will be frank and fair. This plan has been applied to union organizations, to non-union organizations, and to open-shop organizations. The plan has failed in some instances, due, I believe, largely to the fact that the proper spirit of mutual confidence was not established, but the plan has been successful in many other instances. It is my opinion that most, if not all, of our big troubles will not occur if the little ones are properly handled at the right time. All this has to do with our relation to our employees, but we have a further relation to the public.

One of the theories advanced is that 'it is not so much a question of how much wages you pay, as it is whether the wages you figure on paying will maintain during the job'. According to this theory, all we have to do to settle the wage-problem is for us to confer with representatives of labor and agree upon any wage-scale the laborers demand. I assume at this time that, if we agreed to pay common labor $10 per day, they would be satisfied, and we could probably make some agreement protecting us against strikes. If we agreed to pay this wage-scale it would not affect us as contractors because we would all agree to it and we could make arrangements to make it hot for anybody who attempted to jump over the traces. Consequently, we would simply figure on the $10 basis in making our estimates. The result would be quite peaceful so far as we are concerned with labor, but is not this another way of saying 'the public be damned'?

Have we the right to buy peace at such a price? Or, looking at it from a strictly business point of view, can we afford to make work cost so much more than it should? If not, and if the public is a factor to be considered seriously in this connection, should we not take the public into our confidence when we attempt to arrange a wage-scale? I believe that we should, and I believe that such action would inspire a degree of confidence and satisfaction on the part of the public that would be to our advantage. The difficulty has always been, how can you give the public proper representation?

What is the public? Who make it up?

The public is a shifting entity. In one matter you and I are of the public. In another we may be employees. But there is a public in each instance and a plan has been suggested which is along the right line, and which I wish to lay before you. The Industrial Relations Committee of the Portland Rotary Club, has made a recommendation specifically for the city of Portland, but the idea is applicable in any place. They have selected ten organizations as far as possible removed from the employing and employed classes and have asked each of these organizations to appoint one representative to a Nominating Board, which Board will be called into use in any industrial question wherein the public should be represented. The Nominating Board will then suggest representation in the controversy equal in number to that of the employer and of the employee.

To give you an idea of the character of the organizations selected, I will enumerate them: Portland Federation of Churches, Knights of Columbus, B nai B'rith Lodge, Oregon Bankers' Association, Bar Association of Oregon, Portland Association of American Society of Civil Engineers, Medical Society of Oregon, Portland Grade Teachers' Association, Press Club, American Institute of Architects.

When this idea was first made public, one of our critics referred to it as "a nondescript batch of uplifters who could tell the building contractors and the building-trades mechanics . . . how to settle all controversies, and at the same time be rank failures in their own lines and not know anything from actual experience or contact of building problems". It is presumptuous, it seems to me, to assume that a Board composed of representatives of the organizations named will necessarily be rank failures in their own lines of business. Destructive criticism of this character gets nowhere. The people of the coun-

*Abstract from an address before a convention of the Associated General Contractors of the Pacific Northwest, Portland, Oregon.

†The Hurley-Mason Company, Portland, Oregon.

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

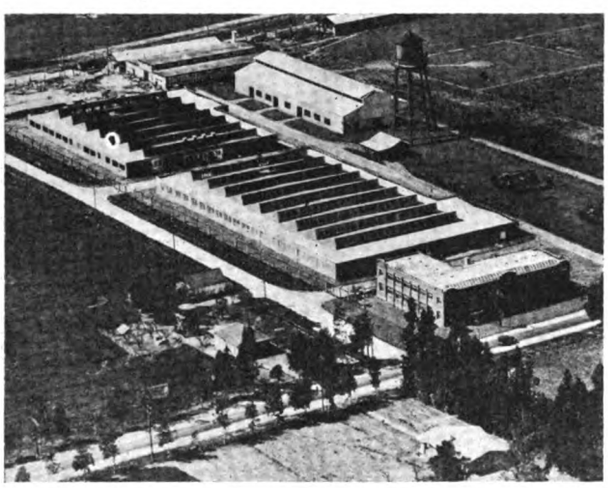
try are searching for a means of public representation. The Portland Rotary Club has made a suggestion that may or may not be the best, but until something better is suggested, why not try it?

Getting back to our starting-point, is it not true that the price we have to pay for industrial peace and industrial efficiency is that "we shall lay aside some of our self-assertive individualism and some of our class consciousness and get rid of our conflict-attitudes and subordinate our pugnacious instincts. If we want democracy, we can have it, and unless much of our talk about democracy is to be open to the charge of insincerity, we must desire some form of industrial democracy, but to get it we must develop a new machinery and acquire a new spirit." The fundamental principles underlying this new spirit must be co-operation, frankness, and fair play.

The New Plant of the Moreland Motor Truck Company

Nine years ago the first two Moreland trucks were built in a small shop in Los Angeles. They were built in reality around an idea, the idea that some day gasoline would be scarce, which led Watt L. Moreland to invent a carbureter that would facilitate the vaporization of low-grade distillates.

With this idea came another, namely, that motor trucks must play an important part in the future of transportation. This led to the determination to build a truck around the gasifier and to build it on the Pacific Coast. Loose change was scarce at that time as high-grade gasoline is at present, and there were many to ridicule the belief that high-grade manufacturing could be done on the Coast, far away from Eastern industrial centres. Nevertheless, the business increased, in fact, increased so rapidly as to be continually outgrowing manufacturing facilities, until finally the management concluded to move its main factory to Burbank and there build a complete new plant, costing in all about $2,000,000. This plant is now finished and the company is moving its equipment from the old plant on North Main street, Los Angeles, to the new one at Burbank, the work of moving being arranged so that there will be no interruption to production.



AEROPLANE VIEW OF THE MORELAND PLANT AT BURBANK

The new plant is situated on a tract of 27½ acres in the city of Burbank on the San Fernando boulevard, 11 miles from the centre of Los Angeles, the main line of the Southern Pacific railroad being at the rear of the property. It comprises at present a two-story brick administration-building, a foundry, which has been in operation for a year, a warehouse, three general manufacturing and assembling units, a gas and oil station, an 80-ft., 75,000-gal. water-tower, and other minor buildings. The total floor-space for manufacturing is over 165,000 sq. ft. The capacity of the plant is ten completed trucks per eight-hour shift. It seems probable that a second shift will be necessary before long.

The buildings have been designed with a view to obtaining both the most economical production and the best working conditions for the employees. From the warehouse to the completed truck, material moves in a straight line. Wherever feasible, machines are equipped with individual-motor drive. The buildings are well lighted and ventilated. Over 50% of the wall area is glass, yet direct sunlight with its accompanying glare has been eliminated. Every workman has a steel locker. Each unit of the plant is equipped with shower-baths and other conveniences. In the administration building is a restaurant where good food will be served to employees at moderate prices. There is a reading-room for employees, and an assembly-hall for dances, meetings, lectures, and other entertainments. The grounds surrounding the buildings are being laid out by a landscape gardener. There are also tennis courts and a baseball diamond adjacent to the plant, and a swimming-pool is soon to be constructed.

The Moreland company has made good and the new plant is one of the evidences of this fact.

THE atmosphere of the smoking-car lent itself to reminiscence, says the Home Sector.

"Captain," asked the hardware salesman, "would you mind telling me how you lost your arm?"

"Not at all, not at all," replied the bronzed officer with the empty sleeve. "It happened this way: We were due for another turn in the trenches the next day, so they were giving a dance for us that night back in the rest-camp. A few welfare workers were there, and among them was the cutest little girl I ever met. I managed to dance with her most of the evening, and toward the end we wandered out in the moonlight. . . . 'Captain,' she said after a while, please remove your arm.'

"And you know, she was such a little queen I just couldn't refuse her."

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Reducing Foundry Costs by Re-Designing Patterns

By EDWARD LESLIE

When patternmaker and foundrymen co-operate, results are sure to follow, as in the following example.

The foundry received an order for several thousand sheaves as shown in Fig. 1. The price was 8½ cents per

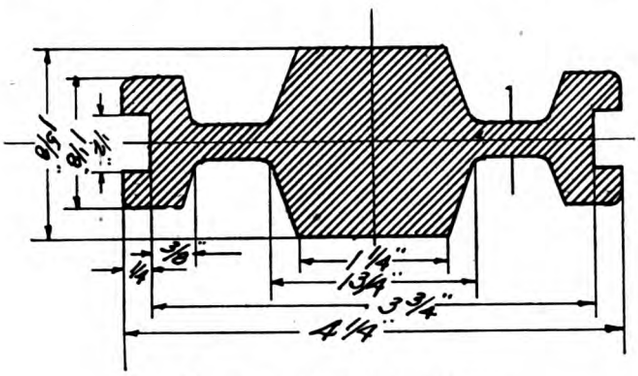


FIG. 1. CROSS-SECTION OF CASTING

pound f.o.b. foundry. They were to be made in white metal, and finished all over. The castings would weigh 4 lb. apiece. A master pattern was made and metal patterns finished all over. Plate *D* (Fig. 2) was made having four patterns and gate as shown in the plan-view,

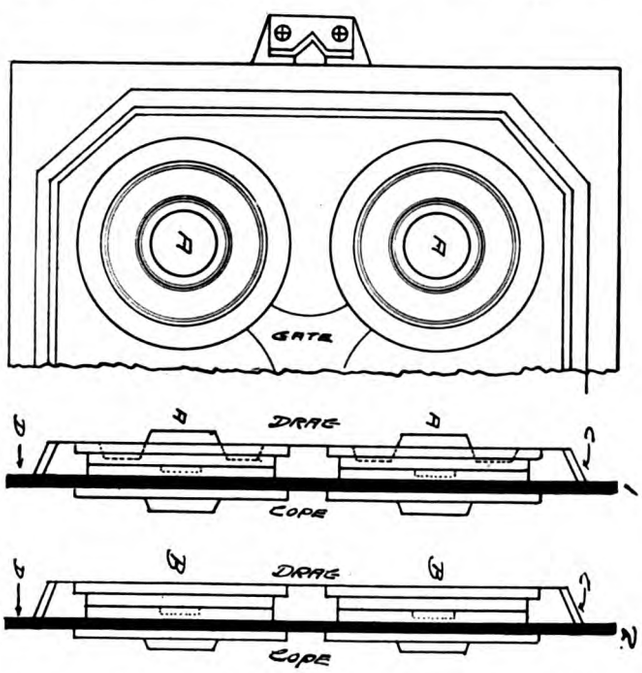


FIG. 2. ORIGINAL AND IMPROVED METHODS OF MAKING PATTERNS, AND CASTING

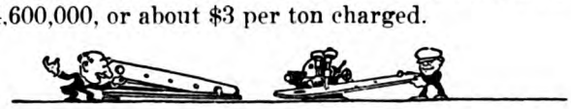
four halves *A*, made with a male and female joint. A cast-iron frame as shown at *C*, was made for a green-sand core. The set was made as shown in section 1, and the first day the molder made the snap-flasks in 12 minutes. The next day it took 15 minutes. The proprietor said that he would lose money. The patternmaker suggested the blank halves *B*, and made a set of four.

The frame and blanks, or dummies, *B*, were put in place as shown in section 2, the green-sand core was rammed and struck off, and the dummy halves removed. The sheave-halves *A*, were then put in place of the dummies, and the cast-iron frame *C*, was taken off. The drag was then rammed, lifted off, and the four halves *A* drawn. After this the drag was closed, cope rammed, the plate *D* removed, and the mold closed. A snap-flask was finished in ten minutes, or at the rate of six an hour, making 96 lb., if all were good. As a result, the work was done at a profit.

Co-operation did the trick, saving time, labor, and loss on the contract.

Development of the By-Product Coke Industry

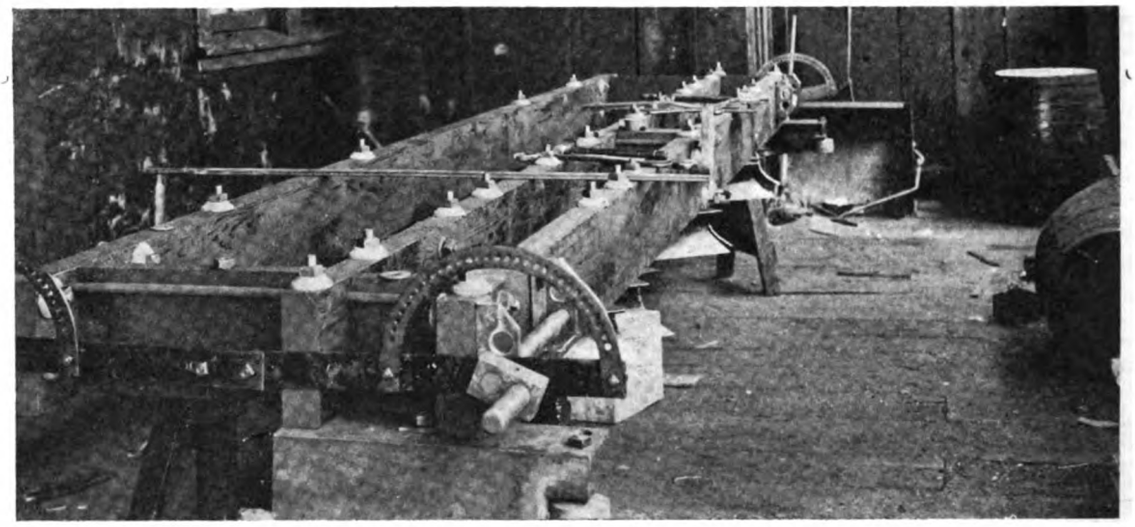
A statement issued recently by the U. S. Geological Survey contains final statistics and other data regarding the coke industry during 1919. The total output decreased about 20% as compared with 1919 corresponding to the decline in production of pig-iron, the blast-furnaces being the principal consumers of coke. This decrease was almost entirely in beehive coke, which amounted to 19,650,000 tons, compared with 30,586,000 tons in 1918. The production of by-product coke was practically the same, a little more than 25,000,000 tons, for each year. In 1919, for the first time, the production of by-product exceeded that of beehive coke. The beehive coke industry is likely to be more and more an auxiliary source of supply carrying the peak-load in times of extreme activity and correspondingly restricted in times of depression. The average recovery per net ton of coal charged in by-product ovens was 18.9 lb. of ammonia, 7.1 gal. of tar, 2.4 gal. of crude light oil, and 10,400 cu. ft. of gas. The total value of products so recovered was $74,600,000, or about $3 per ton charged.



Sand-Blasting Before Painting

In a paper presented before the Master Car and Locomotive Painters Association, J. W. Gibbons, foreman locomotive-painter for the Santa Fe railroad, discussed the cleaning of metal surfaces with the sand-blast before painting. He gave the results of experiments using various sizes of sand for blasting. Sand passing a '4 by 4 mesh' sieve, and also sand passing a '6 by 6 mesh' sieve gave unsatisfactory results because of leaving too rough a surface. On the other hand, sand passing a '10 by 10 mesh' and also a '16 by 16 mesh' sieve gave good surfaces with just enough roughness to hold the paint. He also recommended that the air-pressure used should be between 70 and 90 lb. and that the size of the nozzle should be not less than ¼ in. nor over ⅜ in. diameter.

Generated on 2024-09-30 02:09 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



THE CARR SUB-GRADER

A Road-Making Machine Manufactured in the San Francisco Bay District

The accompanying illustration shows a nearly-completed road-planer, known as the Carr sub-grader, one of an order of 100 being manufactured at the Solano Iron Works of Berkeley for Stuart S. Smith, machinery dealer of San Francisco. The machine is used for making an accurate sub-grade before placing the concrete pavement. The cost of concrete is such that irregularities amounting to only half an inch in the thickness of the pavement may mean hundreds of dollars in the cost of a mile of pavement to the contractor. After the other grading machinery has completed the rough work of preparing the sub-grade and a fairly smooth surface is obtained, this machine is drawn, either by animal or tractor power, along the road, the wheels running just outside the header-boards. The planer-knives, which are set diagonally, shave off the minor irregularities and produce a smooth surface.

The machines are being sold, not only in California, but also in the Rocky Mountain and Middle West States, in competition with similar devices manufactured in Eastern factories. One reason for this is, of course, that they are good machines, but this would not help much if the methods of manufacture were not such as to permit the naming of a price attractive to the buyer. The plant is equipped for multiple production, and the parts are manufactured in quantities large enough to get efficiency in repetition work, with resultant low labor and indirect costs per piece. Besides these road-planers, the company manufactures fresno scrapers, hay derricks and forks, plows, and other agricultural machinery, all on the same quantity-production basis, the plant making a run on one particular machine until a good-sized stock is made up, before changing to other machines. Mr. McAneny, manager of the plant, is of the opinion that wherever the field is such as to provide volume orders, the Pacific Coast manufacturers are in a position to compete with factories in other parts of the country, not only in the local market but elsewhere as well. But this can be accomplished only by the adoption of modern methods.

I HAVE enjoyed the band. While I do not want to be responsible for any discord in the organization, I feel I ought to tell the boys of a conversation I overheard. A young lady seated near the bass-drum asked in an audible whisper, "Why do they have that horrid old noisy bass-drum in the band?" "My dear," said her escort, "if it wasn't for the bass-drum you would hear the clarinets."—'The Tank.'

THE evening party was over, and most of the guests had gone, so the story goes. As one young man took leave of the hostess the lady said:

"I'm sorry you found Miss Biggle a poor conversationalist."

"Poor conversationalist!" exclaimed the guest. "She's absolutely the limit! Why the only thing she said to me during the entire evening was, 'No', and I had to propose to her to get that out of her."—'Los Angeles Times.'

THEY were talking about the different places they had visited during the War. One Australian was saying he had enjoyed the privilege of being on guard one night at the gates of Bethlehem.

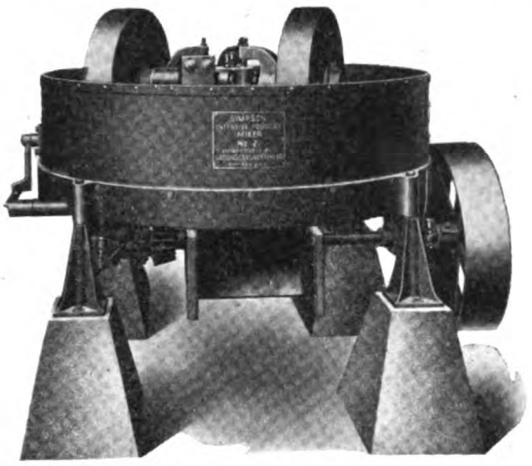
Suddenly another Australian looked up at the first speaker and said: "I'll bet the shepherds watched their flocks that night!"—'Los Angeles Times.'

Generated on 2024-09-30 02:11 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

INDUSTRIAL EQUIPMENT

THE SIMPSON FOUNDRY MIXER

The illustration shows the Simpson foundry mixer manufactured by the National Engineering Co., of Chicago. It consists of a stationary circular pan in the centre of which is placed a vertical shaft, to which is keyed a central supporting casting or cross-head, the latter resting on a turret in which are the bearings for the central shaft, the shaft being



The Simpson Mixer

operated by bevel-gearing, which is placed below the machine and out of the way of the sand and grit. The central casting carries the plows and mullers. The plows turn over and move the sand alternately outward and inward, while the mullers revolve on their own axes around the centre of the pan, the path of the mullers being at a point where the mixture is heaped the highest by the movement of the plows. This arrangement gives the most efficient mixing possible. The mixer is made in three sizes: the No. 0, which has a pan diameter of 3 ft., and a capacity of 1½ to 2 cu. ft.; the No. 1, which has a pan diameter of 4 ft., and a capacity of 3½ to 4 cu. ft.; and the No. 2, which has a pan diameter of 6 ft., and a capacity of 7 to 10 cubic feet.

METAL INDUSTRIES TO TAKE ACTIVE PART IN NATIONAL FOREIGN TRADE CONVENTION

With more than 1200 delegates already registered for the Seventh National Foreign Trade Convention, May 12 to 15, at San Francisco, the complete success of the convention is assured. For the first time in the history of the National Foreign Trade Council, foreign governments have been invited to participate. Ten countries bordering on the Pacific or in South America or their dependencies are already represented by accredited delegates, and it is predicted that by the time the convention meets there will be at least ten more, giving to the convention an international scope.

A glance through the list of delegates accredited shows the high importance attaching to the convention by the various industries identified with the metal trades. Heading the Foreign Trade Council is James A. Farrell, chairman of the Board of Directors of the United States Steel Corporation, and among the various groups from the different cities are individuals and firms thoroughly representative of the entire industry.

As an example of the variety of metal interests represented a glance at the first page of the weekly list of delegates issued at headquarters in San Francisco shows the Acheson Graphite Co. of Niagara Falls; Allied Machinery Co. of America, of New York; American Cast Iron Pipe Co., of Birmingham; American Chain Co., of Portland, Oregon; and the American Laundry Machinery Co., of Cincinnati.

Other concerns of national prominence noted in the list of accredited delegates are the Bethlehem Steel Co., Chicago Bridge & Iron Works, Colorado Fuel & Iron Co., Consolidated Steel Corporation, John Deere Plow Co., United States Steel Corporation, International Harvester Co., Meese & Gottfried Co., National Association of Steel Iron Plate Manufacturers of Pittsburgh, Seattle Car & Foundry Co., and so on through the list.

Among the delegates thus far accredited, all of the major lines of American finance, industry, commerce, and trade are equally well represented. It is estimated that the delegates will represent three-fourths of the invested wealth of the United States and a similar proportion of the payrolls.

The entire Pacific Coast has co-operated with San Francisco to make the convention notable and it remains now for each business man who has not yet secured his delegate rating to register immediately for participation in what has been described as the greatest convention in its possibilities that has ever been held at a Western port and probably the greatest world trade convention ever held.

Headquarters for the Seventh National Foreign Trade Convention are at 1237 Merchants Exchange building.

INTERNATIONAL CHAMBER OF COMMERCE TO BE ORGANIZED

The new International Chamber of Commerce, projected at the International Trade Conference at Atlantic City last October, will be formally organized at Paris during the week of June 21, 1920. Invitations have been sent by the American group of the International Organization Committee to business and industrial associations, asking them to name delegates to participate in the organization meeting. About 100 American delegates are expected to attend. The International Organization Committee, which was provided for at the International Trade Conference, is to meet at Paris in advance of the general organization meeting, which will be held in June, to prepare and report a plan of permanent organization, the basis of which was drafted and approved at the International Trade Conference.

In view of the disturbed conditions in international trade brought about by the exchange situation, this meeting is expected to assume considerable importance aside from the fact that the International Chamber is to be organized. The important question of international credit, as well as shipping, tariff regulations, unfair competition in international trade, and other problems of equal importance affecting stability in international trade and production in all the principal countries of the world, will be discussed.

American members of the Organization Committee whose names are now announced, are: A. C. Bedford, Chairman; Thomas W. Lamont, Edward A. Filene, Richard S. Hawes, John H. Fahey, and S. C. Mead.

The foreign members of the Committee are as follows:

From Belgium, Louis Canon-Legrand, Chairman; Paul Van den Ven and Alexander De Groote. Two additional members of this committee will be named by the Central Committee of Industry of Belgium.

From France, Eugene Schneider, Chairman; M. Tirman and M. Roche.

From Great Britain, Lord Desborough, Chairman; Sir Arthur Shirley Benn, Edward Manville, Stanley Machin, and R. B. Dunwoody. One member of the committee will be named to represent the banking interests of Great Britain.

From Italy, Ferdinando Quartieri, Chairman; Vittorio Meneghelli, Giorgio Mylius, Pietro Giovanni Lazzerini, and Augusto Jaccarino.

The International Chamber succeeds the old International

Generated on 2024-09-30 02:12 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Congress of Chambers of Commerce which ceased to function with the outbreak of the World War in 1914.

The specific aims of the organization as outlined by the Committee on Organization are:

To create a permanent international headquarters to centralize all data concerning economic subjects and social conditions; the facts relating to the respective needs, present production, and future possibilities of each country.

To act as an instrument of co-ordination that will suggest trade regulations and legislative measures to facilitate and encourage the development of commerce.

To inform public opinion through the publication of facts with regard to business conditions and through the dissemination of views of technical experts and business men.

To put at the disposal of all official organizations the reports and conclusions prepared by these experts and business men.

The Committee on Permanent Organization of the International Trade Conference agreed tentatively that the constitution of the new Chamber should provide, among other things, for:

A board of directors composed of two members selected by each nation.

An international headquarters, with one representative of each nation attached to it, assisted by technical experts, all to be under the direction of a general secretary.

A corresponding bureau in each country.

Membership to consist of chambers of commerce, commercial organizations, banking and similar associations, firms, co-operations, and individuals, holding associate but not voting membership.

Meetings of the membership every two years.

A system of referenda to be issued during the interval between the biennial meetings of the members.

Other objects of the association are:

To make import and export trade easier.

To remove international friction, much of which begins with commercial differences.

To safeguard international trade against waste and fraud.

To increase the total production of the world, and make the production available to the people of the world.

To standardize international documents, practices, and laws affecting commercial intercourse.

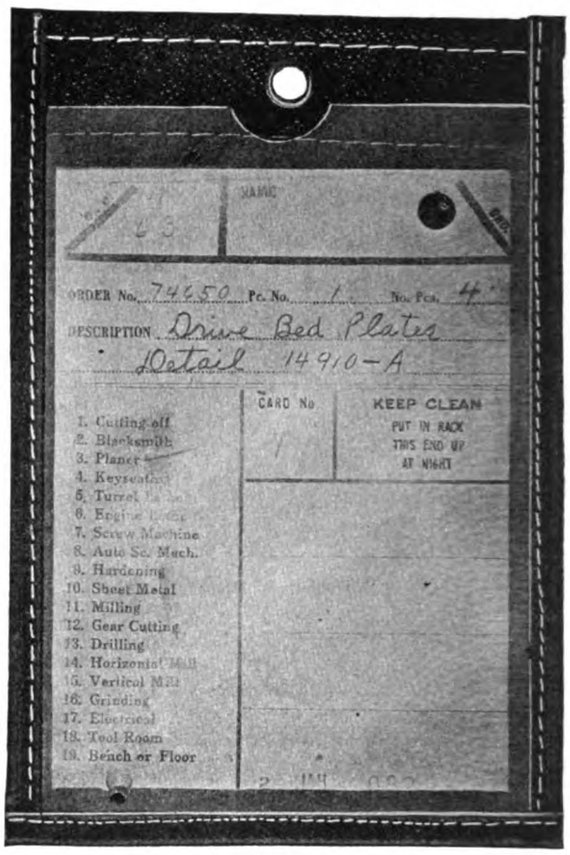
To increase mutual profitableness of international transactions.

To cultivate personal acquaintanceship among business men and bankers of the different nations of the world, and thus lessen international prejudices and misunderstandings.

At the first meeting in June only the five countries participating in the International Trade Conference, the United States, Belgium, Great Britain, France, and Italy, will be represented. Later, business organizations in the other principal countries of the world will be taken into membership.

FACTORY JOB-TICKET CARRIERS

One of the efficiency devices used in most well-organized manufacturing institutions is the flexible card-holder with transparent face for carrying the job-ticket that travels with each job through the factory. These are sometimes called job-travelers. Without some protection from grease and from soiled hands of workmen, the job-ticket soon becomes illegible and delays and mistakes occur. The flexible card-holder pays for itself over and over again. These holders are sold by different concerns making factory equipment. They can also be made easily. In some factories they can be made entirely from scrap material. The best kind of holder is made with a back of leather substitute or rubber-coated cloth and a front of transparent sheeting. The back is turned over the edge of the sheeting and stitched down so as to make a pocket open at the top. This pocket is water, grease, and stain proof, and the inside tag is legible all the time. If it is necessary to read both sides of the tag and it is not desired to remove the tag to do this, a double-faced holder can be made in which both the front and back are of the sheeting. Many shops, particularly those in the automobile industry, use a great deal of leather substitute



Job-Ticket Carrier

and transparent sheeting for automobile tops and curtains and they can make these card-holders out of scraps. Where the material has to be purchased, it is better to use a leather substitute which has a pyroxyline coating than a rubber-coated cloth. The rubber will not stand up well in contact with oil, while the leather substitute does.

Book Reviews

Technical Writing. By T. A. Rickard. Pp. 174, index. John Wiley & Sons, Inc., New York. For sale by 'Mining and Scientific Press'. Price, $1.50.

As the author states in his opening chapter, "Science is not divorced from literature and no valid reason exists why technology should be regarded as if it were legally separated from good English". The book not only shows the incorrectness of this belief, but also indicates the means whereby a better understanding between the two contracting parties may be attained. Good technical writing is shown to be not a matter of literary frills, but rather one of expressing the meaning of the writer so that the reader can grasp it without unnecessary mental effort. The rules given for accomplishing this end are necessarily many, but they are all based upon the fundamental principle, 'Remember the

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

reader'. The titles of the chapters on Naturalness, Clearness, and Precision, respectively, are self-explanatory. In the discussion of Superlatives and Other Diluents, such as 'considerable', 'probably', and 'rather', the indiscriminate use of these words is condemned. Similar disapproval is expressed in the next chapter regarding the use of other meaningless words, a use that serves merely to weaken the sense of whatever statement is made. In the chapter on the relative pronouns, the student will be enlightened regarding the clearness obtained by the correct use of these words, which are so frequently used incorrectly in ordinary speech and writing. An important feature of the chapter on prepositions is the discussion of the use of single-word verbs in place of the preposition-verbs whose prepositions so often show a tendency to land at the end of the sentence. Hyphens as aids to clearness, particularly in technical writing, are discussed in the next chapter. The chapters on Slovenliness and Jargon appropriately follow each other, and the author has found no difficulty in collecting plenty of examples to illustrate the faults that he describes. The titles of the remaining chapters, namely, The Construction of Sentences, Composition, and Style, need no comment. Although the book is based on a series of lectures delivered before the mining students of the University of California, and most of the illustrations are naturally drawn from mining engineering, the book should be in the hands of everyone that writes technical English, whether in book, magazine article, or trade catalogue.—A. T. P.

Trade Notes

The Forest Grove Brick & Tile Co. is building a plant at Forest Grove, Oregon.

The Vancouver Furniture Co., of Vancouver, Washington, is increasing its plant.

The Ensign Carbureter Co., of Los Angeles, is building an addition to its factory.

The Ohio Match Co. will build a factory to cost about $200,000 at Yardley, Washington.

The Campco Tractors, Inc., of Stockton, has purchased a five-acre tract on which to build a factory.

D. W. Douglas, chief engineer for the Glenn L. Martin Airplane Co., visited Los Angeles during April.

The Tilley Brass Manufacturing Co. has moved into its new plant at 3209 Boaz street, Los Angeles.

The Diamond Match Co. is making improvements in its plant at Chico costing approximately $71,000.

The Garlock Packing Co., of Palmyra, New York, is considering the construction of a factory at Los Angeles.

The Ulmer Machinery Co., of Porterville, has completed a new factory, which will be used for manufacturing turbine-pumps.

The Alloy Steel & Metals Co., Inc., 2176 East Ninth street, Los Angeles, is installing a Pangborn sand-blast outfit in its foundry.

The box-factory at Bay Point has been leased by **William Smith** of San Francisco and will begin operation as soon as possible.

The California Metal Trades Foundry, Alameda, poured its first heat in the early part of April, and is now running at capacity.

The Walling-Miglivacca Corporation is converting the old Miglivacca Wine Co. building at Napa into a $200,000 cold-storage plant.

Ben E. Myers, Harry L. Croson, L. L. Steidley, Ruth E. Myers, and H. Klein have organized the **Peerless Manufacturing Co.** of Oakland.

The Laher Auto Spring Co., of Seattle, will establish a branch manufacturing plant at Spokane. A building has already been purchased.

H. G. Mitchell, president of **Harron, Rickard & McCone**, recently returned from a business trip through the principal Eastern cities.

Surveys have been made by the **Michigan-California Lumber Co.** for a railroad in El Dorado county from Shingle Springs to Pino Grande.

The Shell Oil Co., will soon make additions to the plant at Martinez that will double its size and capacity. The estimated cost is $1,250,000.

The main part of the sawmill of the **Coal Creek Lumber Co.**, at Chehalis, Washington, has been destroyed by fire. The loss is estimated at $150,000.

A. E. Lane and H. C. Hough, of Chico, operating under the name of the **Chico Truck & Tractor Co.**, are building an auto-repair shop at a cost of $5000.

Charles C. Moore heads the list of delegates favorable to Hoover to the Republican National Convention to be voted upon at the California primary on May 4.

The Grays Harbor Lumber Co., of Hoquiam, is considering the construction of a lumber-mill at Vancouver, Washington. About 1500 men would be employed.

The Pacific Metal Works announces that T. E. Wales has been appointed sales manager, succeeding D. W. Gorman, who has withdrawn from the organization.

Contract for the construction of a 15,000-ton steel tank-steamer for a Norwegian syndicate has been awarded to the **Skinner & Eddy Shipbuilding Co.**, of Seattle.

The Madsen Iron Works, Los Angeles, has broken ground for its new foundry at Huntington Park. It will be equipped to do much heavier work than the old plant.

The Farmers Warehouse Co., of Spokane, is building a fire-proof concrete 100,000-bushel grain-elevator at Almira, Washington. The estimated cost is $50,000.

The plant of the **San Joaquin Ice Co.** at Fresno was almost completely destroyed by fire on April 18. The loss is estimated at $200,000, mainly damage to machinery.

The Los Angeles Pacific Navigation Co. has purchased the steamers 'Yale' and 'Harvard' from the Emergency Fleet Corporation and will use them on coasting service.

In order to increase its facilities, the **Killefer Manufacturing Co.** has bought six acres on 58th street near Slauson avenue, Los Angeles, and will build a new factory there.

The Pacific Car Building Co., which had intended to build its factory for manufacturing railroad-cars and automobile busses at Sacramento, has decided to go to Woodland instead.

The State Railroad Commission of California has authorized the **Midway Gas Co.** to issue $500,000 in notes, the proceeds to be used for the construction of a 60-mile gas-line near Taft.

The G. M. Standifer Construction Corporation, of Vancouver, Washington, launched the 9500-ton steel steamer 'Areturus', the first of five such vessels to be built by the company.

The California Sheet Metal Works has been incorporated in San Francisco with a capital of $100,000 by M. Schwartz, T. M. Warren, C. L. Coppage, A. H. Dougall, Jr., and A. C. Lackenbach.

David Rodgers has acquired the Skinner & Eddy No. 2 shipyard at Seattle from the U. S. Shipping Board. Mr. Rodgers has obtained orders for the construction of several tank-steamers.

Edwin R. Snyder, formerly California State commissioner of vocational education, has resigned to become assistant for vocational education for the Western Department of the War Department.

Paul and **Hugh J. Armstrong**, of Chicago, recently bought a 64-acre tract of land in Astoria, Oregon, and expect to

Generated on 2024-09-30 02:12 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

erect a branch plant there for manufacturing mechanics' high-grade tools.

The Wilder Manufacturing Co., of Vallejo, has been incorporated to manufacture machinery. The incorporators are W. S. A. Wilder, W. H. Huckill, C. E. Mackie, A. C. Kerr, and S. C. Baker.

The Acme Gas Engine Co. is moving its equipment from 11 Minna street to the building at 163 Main street formerly occupied by the Main Iron Works, which is being remodeled for the Acme company.

The National Radio Co., San Francisco, will erect a two-story plant at Twentieth street near Folsom at a cost of about $65,000 for the manufacture of wireless and radio equipment of all kinds.

L. S. Rosener has been in Seattle superintending preparations for the towing of the floating drydock formerly at the Skinner & Eddy shipyard to the yard of the Moore Shipbuilding Co. at Oakland.

The Port of Portland has awarded a contract for constructing a five-pontoon 15,000-ton floating drydock to **William Cornfoot**, of the Albina Engine & Machine Works, and **Robert McIntosh** for $761,345.

A. H. Gilmore, for many years an employee of the Moore Shipbuilding Co., of Oakland, has established a boat-building plant under the name of the **West Berkeley Boat Shop**, at 2100 San Pablo avenue, Berkeley.

The Pangborn Corporation has published a useful chart mounted on durable cardboard, and showing the air-flow and the horse-power required for sand-blast nozzles of various diameters and for various pressures.

The buildings formerly occupied by the Acme Gas Engine Co., on Minna street, have been leased by Bannon, Bodison & MacIntyre, Inc., the Federal Sign System Electric Co., and the Kennedy Valve Manufacturing Co.

On account of the impending shortage of hydro-electric power, Reclamation District No. 108 is constructing a steam-power plant to cost $80,000 at Knights Landing. The power will be used for pumping for rice irrigation.

The Peerless Manufacturing Co., of Oakland, has been incorporated with a capital of $15,000 by Ben Myers, Harry L. Croson, L. L. Steidley, Ruth E. Myers, and H. Klein for the purpose of operating a general motor-accessory plant.

The Wilkinson Auto Parts Co., of 1524 South Grand avenue, Los Angeles, has been organized by E. F. Wilkinson, Elizabeth Wilkinson, and J. L. Benedict. The company will manufacture shafts for automobiles, trucks, and tractors.

The Lakewood Engineering Co. has opened an office in the Rialto building. This office will handle the company's business for the entire Pacific Coast, including British Columbia and the Hawaiian Islands and as far east as Denver.

Contract for the construction of a new steel hull and deck-house for the dredge 'Columbia', owned by the Port of Portland, has been awarded to the **Pacific Marine Iron Works** for $425,500. The work is to be completed by January 15, 1921.

The Resilient Safe Wheel Co., of Oakland, has been incorporated with a capital of $200,000 by D. A. Bohannon, D. D. Bohannon, and G. A. Bohannon, all of Berkeley. A factory will be erected to build wheels for aircraft and automobiles.

The Bushnell Manufacturing Co., of Berkeley, has been incorporated with a capital of $50,000 by John B. Bushnell, Edward J. Hultman, and W. T. Merriman for the manufacture of automobiles, motorcycles, and appliances and accessories.

Articles of incorporation of the **United Box Co.**, of Astoria, Oregon, have been filed by W. F. McGregor, W. P. O'Brien, and G. A. Prouty. The company is capitalized at $100,000 and plans to build and operate a box-factory at Alameda, California.

The Clark Equipment Co., of Buchanan, Michigan, has issued an attractive booklet containing the Constitution of the United States, and illustrated with portraits of the Presidents and other statesmen, also sketches of the plant of the company.

The capital of the **Honolulu Iron Works** is to be increased from $1,000,000 to $3,000,000. Of the increase $1,400,000 will be distributed as a stock-dividend and the remaining $600,000 will either be sold to stockholders or otherwise restricted as to sale.

Harry N. Ripple, representing the Cleveland Automatic Machine Co. of Cleveland, Ohio, has been visiting the local manufacturing shops in the interests of his firm, in company with the salesmen from one of the local machinery houses handling this line.

E. D. Burge, of Santa Ana, has organized the **Universal Steel Wheel Co.** with a capital of $100,000 to manufacture steel wheels, shock-absorbers, and universal joints for automobiles. A factory costing $50,000, including equipment, will be constructed at Newport Beach.

The General Reduction & Chemical Co., of Salt Lake City, is planning to build a $500,000 branch factory in San Francisco. George E. Kingsley, president of the company, will be in San Francisco shortly after May 1, and expects to complete arrangements for the new plant.

The Ingersoll Milling Machine Co., of Rockford, Illinois, has issued bulletin No. 39 describing the continuous milling machines manufactured by the company, including the differential, drum, and rotary and circular table types as well as the more familiar reciprocating machines.

William Harris, manager of the **C. H. Crowley Co.**, of New York, manufacturers of steel needles and pins, has been visiting San Francisco for the purpose of making arrangements to establish a pin and needle factory here. W. S. Nightingale will probably be manager of the local branch.

H. W. Menzener, factory representative of **J. H. Williams & Co.**, Brooklyn, New York, manufacturers of drop forgings, wrenches, and tool-holders, has opened offices at 1174 Phelan Bdg., San Francisco, from which he will give service on the Williams lines to the entire Pacific Coast territory.

W. H. Jahns, 2662 Lacy street, Los Angeles, manufacturer of semi-finished pistons, is doubling the capacity of his plant. The new equipment includes a larger cupola than the one at present in use, molding machine, and Pangborn sand-blast outfit, furnished by Ditty Brothers, San Francisco.

McLain's System, Inc., of Milwaukee, has issued an interesting booklet containing a synopsis of the two courses in foundry practice offered by the company. One of these covers gray iron, semi-steel, and general cupola practice, and the second deals with steel-foundry practice including all processes.

The manufacturing sales-department of the **Wellman-Seaver-Morgan Co.**, which handles the company's sales of rubber equipment and machinery, and which is in charge of L. N. Ridenour, moved on March 31, from the company's Akron office to its general offices at 7000 Central Ave., Cleveland.

The plant formerly occupied by the **Killefer Manufacturing Co.** at 2209 Santa Fe avenue, Los Angeles, has been sold to the **Plomb Tool Manufacturing Co.** It will be remodeled and used as a factory for making the Plomb company's line of tools for boilermakers, bricklayers, carpenters, plumbers, and tinners.

A. G. Bohannon, sales engineer for the **Moreland Motor Truck Co.**, sailed from San Francisco April 20 for a trip through the Orient in the interests of the company. He expects to be gone nearly a year and will visit the Hawaiian Islands, Japan, China, the Philippine Islands, Australia, and India, returning by way of Europe.

The Hanford Iron Works, San Bernardino, has started

Generated on 2024-09-30 02:06 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

erection of its steel-foundry. The main bay is 40 ft. wide and has ample crane-facilities. A one-ton Greene electric furnace will be installed. The cleaning-room equipment includes a Pangborn sand-blast apparatus. The plant will be a modern steel-shop in every respect.

George Mathews, proprietor of the **Novelty Iron Works,** Fresno, has dismantled his old foundry and moved into his new brick building on Railroad avenue. The new shop is equipped with modern facilities and can handle all classes of light and medium weight work. The equipment was furnished by Ditty Brothers, of San Francisco.

The Standard Drop Forge Co., of Oakland, has been incorporated with a capital of $1,000,000 by E. I. de Laveaga, San Francisco; Clarence L. Johnson, Oakland; Walter W. Johnson, Berkeley; Walter D. Cole, Oakland; and A. W. Shepherd, Berkeley. A large plant will be built at Oakland for the manufacture of forgings of every kind.

The Master Welding Co., Inc., of Los Angeles, has obtained permission to issue $30,000 worth of stock for a certain patent, tools, and implements and the lease of property to be used in the manufacture of a patented device relating to welding. The company is also permitted to sell $20,000 worth of stock for capital with which to do business.

The U. S. Shipping Board received bids on April 19 for the purchase of the two shipbuilding ways and other equipment of the **Columbia River Shipbuilding Corporation.** Bids were received from the Northwest Bridge & Iron Co., the successor of the Northwest Steel Co., from the Alaska Junk Co., and from the Elerath Steel, Iron & Wrecking Company.

W. H. Patterson, manager of the re-sale section of the **Westinghouse Electric & Manufacturing Co.,** has been appointed assistant to the manager of the industrial department in charge of metal-working and wood-working industries. Mr. Patterson is an authority on motors and control-apparatus for application to cranes, elevators, hoists, and machine-tools.

The Columbia Steel Co. started to operate the new 18-in. rolling-mill at its Pittsburg plant on March 29 and its finishing-mill on April 5. The first steel from the new mill was loaded for export from pier 39, San Francisco, on April 16. The company expects to roll plain round and square reinforcing bars from ⅝ to 1½ in., deformed square bars from ¾ to 1½ in., and rivet-rods ⅝ in. diam. and larger.

The members of the **San Francisco Section** of the **American Society of Mechanical Engineers** and their friends were the guests of the Moore Shipbuilding Co. and the Skandia-Pacific Oil Engine Co. on an inspection trip covering the plants of both companies on the afternoon of April 29. At the Skandia plant an opportunity was afforded for observing the new 1100-hp. Werkspoor Diesel marine engine now being given a 30-day non-stop test.

J. H. Williams & Co., manufacturers of drop-forgings, drop-forged wrenches, tool-holders, etc., recently announced the purchase of the Chicago drop-forge plant of the Whitman & Barnes Co., from which point they will take care of the Western and Middle Western territory demand for these lines. They have also purchased the Canadian plant of the same people, in both cases taking only the drop-forge line of the Whitman & Barnes concern.

'Power Transmission in Principle and Practice' is the title of a neat new publication from the **Main Belting Co.,** manufacturer of Leviathan and Anaconda belts. It presents in concise form the standard formulas and data developed by leading transmission engineers for the selection and use of belts. The service required of a belt determines what kind, grade, ply, and size of belt should be selected. The pamphlet supplies this information in a convenient way.

George L. Budroe, factory representative on the Pacific Coast for the **Carborundum Co.,** has returned from his annual trip to the factory at Niagara Falls. Mr. Budroe reports an optimistic feeling in the metal trades and announces a number of new articles in process of production from the plant of the Carborundum Co. Mr. Budroe can be reached at any time through **Harron, Rickard & McCone,** the northern California agents of the Carborundum Company.

The Pawling & Harnischfeger Co. has established branch offices in the L. C. Smith Bdg., Seattle, and the Yeon Bdg., Portland, in charge of S. W. Selfridge. These offices will handle the sale of all Pawling & Harnischfeger products including electric traveling-cranes, electric hoists, electric transfer-cars, machine-tools, single-line grab-buckets for foundry work and general handling of materials, electric monorail systems, excavators, trench-machines, backfillers, and tampers.

A. S. Lindstrom, 519 California street, has been appointed Western representative for the Electric Furnace Construction Co., of Philadelphia, manufacturing the Greaves-Etchells electric furnace; the Adams-Bagnall Electric Co., of Cleveland, manufacturing reflectors for industrial lighting; the Ohio Electric & Controller Co., of Cleveland, manufacturing lifting magnets; and the Fischer Machine Co., of Philadelphia, manufacturing machine-tools, including the Fischer oil-groover.

Charles C. Phelps recently became associated with the **Uehling Instrument Co.,** 71 Broadway, New York, combustion engineers and manufacturers of fuel-economy apparatus. He is devoting most of his attention to research work in connection with the efficient combustion of fuel-oil in boiler-furnaces. It is estimated that nearly $100,000,000 is wasted unnecessarily every year, due to improper methods of burning fuel-oil, which fact shows the importance of this field of investigation.

The Western Rolling Mill Corporation, of Seattle, has been incorporated with a capital stock of $2,000,000, divided into $250,000 preferred and $1,750,000 common stock. Plans for the first unit of the plant include open-hearth and electric furnaces and rolling-mills. Besides its industrial plant, the company is also considering the establishment of a 'garden city' for its employees near the plant. The officers are J. Johnson, president; J. M. Price, vice-president; Frederick Bruhn, secretary-treasurer.

'Little David' pneumatic drills, grinders, and saws are described in a recent catalogue issued by the **Ingersoll-Rand Co.** The company claims that the 'Little David' drill will do more work per unit of power and will take a greater load without stalling than any other drill built for equal duty; that it has at least one-third fewer parts than any other similar drill; and that it requires less attention and costs less to repair than any other drill. It can be disassembled in one-third of the time required by any other make.

The first heat has been poured at the new steel foundry at the **Southern Pacific Co.** shops at Sacramento. The foundry is a corrugated iron and wood-frame building with a central bay 64 by 128 ft. and two side bays each 32 by 128 ft. It is equipped with a 6-ton Heroult electric furnace with General Electric control. It is expected that all the steel castings and forging-ingots required for the entire Southern Pacific system will be made there, in place of buying them from Pacific Coast and Eastern manufacturers, as at present. About 50 men will be employed.

The Keystone Iron & Steel Works, Los Angeles, has completed its new foundry building and is now installing the equipment. This will be one of the most modern equipped foundries in the country. The building is concrete including the roof. The walls are glass sash. The main floor is 40 by 450 ft. with two side floors each 38 by 450 ft. The machine-shop, which is now 20% completed, will be the same size as the foundry. This company manufactures oil-well equipment, fire hydrants, and in the new plant will also manufacture a track-layer tractor. The contract for

Generated on 2024-09-30 02:07 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

equipping the foundry was awarded to Ditty Brothers, San Francisco.

The Northwest Steel Co., of Portland, which built 36 steel steamers for the U. S. Shipping Board, has gone out of business and its shipbuilding plant has been taken over by the **Northwest Bridge & Iron Co.** Neither J. R. Bowles or W. B. Beebe, principal stockholders in the Northwest Steel Co., are interested in the new company, whose directors are W. R. Bowles, W. H. Cullers, and L. R. Banks. The new company will start work early in May on the construction of seven 12,000-ton steel tank-steamers for the Swiftsure Oil Transport Co. The yard will be run open-shop on a 44-hour week, paying 88 cents per hour to most skilled mechanics, 66 cents to helpers, and 60 cents to laborers. About 4000 men will be employed.

The Oxweld Acetylene Co., of Newark and Chicago, has recently extended its manufacture of oxy-acetylene apparatus and equipment to include 'Eveready' welding and cutting outfits. This is a new name in the oxy-acetylene field, but the apparatus is not new, excepting for certain refinements of design. It has been used extensively in the metal-working trades for several years under the name of 'Prest-O-Lite' apparatus. The new name was adopted by the Oxweld company to suggest the ready convenience, adaptability, and general-purpose uses of the equipment. The apparatus is designed to use exclusively with compressed acetylene in cylinders, thus providing the welder and cutter in a compact and complete portable outfit.

To meet the rapidly growing demands of its business the **A. H. Simpson Co.** is enlarging its machine-shop, installing about $10,000 worth of new apparatus, and greatly increasing its facilities to ensure immediate delivery of re-built equipment. The new installations, which include a $4800 lathe and a $3000 miller, will permit the handling of much heavier work than could have been taken care of in the past. A part of the new equipment will be largely devoted to the manufacture of a new carburetor for use with a low-grade fuel. This carburetor has been in use under various severe tests and conditions and, according to the manufacturers, has satisfactorily demonstrated a marked superiority over present devices for carburetion of low-grade fuels.

Standardization in the manufacture of gears was one of the important subjects discussed at the fourth annual meeting of the American Gear Manufacturers Association, which was held at the Hotel Statler, Detroit, Michigan, April 29, 30, and May 1. An entire day of the convention was devoted to the various angles of this subject, and reports were given by committees that have had it under consideration for months. The program included papers on 'Gears From a Purchaser's Standpoint' by D. G. Stanbrough, of the Packard Motor Car Co.; 'Routing of Gears and Machine Parts Through the Factory' by J. A. Urquhart, of the Browne & Sharpe Manufacturing Co.; 'The Science of Manufacturing' by Henry M. Leland, president of the Lincoln Motors Co.; and other phases of gear manufacturing. A visit to the plant of the Ford Motor Co. was an interesting event of the convention.

For the convenience of subscribers and others requiring technical books the Book Department of 'Mining and Scientific Press' has prepared a 72-page catalogue of books carried in stock at San Francisco. A copy will be mailed upon request to those interested. A summary of the contents of each book is given and in addition to an index by authors the following grouping according to subjects is made: Assaying, Chemistry, Civil Engineering, Concrete Construction, Cyanidation, Electrical Engineering, Electro-Chemistry, Engines, Geology, Hydraulics, Iron and Steel, Irrigation, Law, Machine Shop and Foundry, Mathematics, Mechanical Drawing, Metallurgy, Mineralogy, Mining Practice, Miscellaneous, Miscellaneous Engineering, Ore Deposits, Ore Dressing, Petroleum, Placer Mining, Prospecting, Scientific Management, Smelting, Structural Engineering, Surveying, and Water Power.

The first aircraft exposition on the Pacific Coast was held at the Exposition Auditorium in San Francisco, April 21-28. Besides large exhibits of aeroplanes and dirigibles by both the Army and the Navy, the Curtiss, Cooper, Martin, Wright, Continental, Boeing, Dayton-Wright, and Loughead companies, all manufacturing aeroplanes were represented. The Dayton-Wright company is a subsidiary of the General Motors Co. The Loughead company is a Californian concern, the factory being at Santa Barbara. In addition to the companies making complete machines, the Hall-Scott Motor Car Co., of Berkeley, exhibited its A-5-A, L-4, and L-6 aeroplane-engines, John A. Roebling's Sons Co. exhibited aeroplane wires and cable, the Goodyear Rubber Co. exhibited balloon-cloth for dirigibles as well as various aeroplane accessories, and Jacuzzi Bros., of Berkeley, exhibited aeroplane-propellors.

The Works Council at the plant of the **Moore Shipbuilding Co.** announces that the company has arranged with the Aetna Life Insurance Co. for a group policy covering all the employees of the company, without medical examination. Additional provision is made for employees under 60 years of age in case they become permanently and totally disabled. This insurance is issued without cost to the employees and is in addition to any payments provided under the Workmen's Compensation Act. All those in the employ of the company on April 16, 1920, are insured for the sum of $500, increasing by annual increments of $100 until a maximum of $1000 is reached. All those employed after April 16, 1920, will be insured for $500 upon completion of one month of service, increasing by annual increments of $100 until a maximum of $1000 is reached.

The Flexible Steel Lacing Co. points out some of the reasons why steel belt-lacing is recommended instead of the older kinds. Probably the most important is the feature of time saving. While cemented belt-ends have great strength, the requirement of time and the services of an expert to make repairs have stopped the use of cemented belts wherever they can be done away with. Leather lacing is still in general use, but is constantly losing favor because of the difficulty and delays in making the joint and because of the low proportion of strength which the lacing gives as compared with that of the belt. Alligator steel belt-lacing has the advantages of (1) time saving—the delay caused by a broken belt is practically negligible; (2) strength—the strength of Alligator lacing averages 60% of the breaking-strain of the belt while the average working-strain on a belt does not exceed 20%; (3) high efficiency—permits use of either face of belt in contact with pulley, gives the greatest arc of contact with pulley, is thoroughly adaptable to use on all belts and pulleys of both large and small diameter.

Market Review

The shortage of almost every kind of iron and steel product has been aggravated during the past month by the 'outlaw' railroad strike. Some furnaces and mills have been closed down because of inability to get supplies while those that are running are unable to make shipments. The conditions on the railroads improved slightly toward the latter part of the month but deliveries are still very uncertain. In such a disturbed condition of the market, quoted prices have comparatively little significance, as the price that the buyer is willing to give for immediate delivery is frequently determined by what he can afford to pay. No. 1 foundry iron is selling around $48 at the furnace. The local warehouse price on steel is $5.75 per 100 pounds.

Generated on 2024-09-30 02:05 GMT / https://hdl.handle.net/2027/uiug.30112007837690
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN